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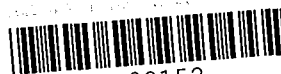
A Computer Code for Swirling Turbulent Axisymmetric Recirculating Flows in Practical Isothermal Combustor Geometries

D. G. Lilley and D. L. Rhode

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A Computer Code for Swirling Turbulent Axisymmetric Recirculating Flows in Practical Isothermal Combustor Geometries

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1. INTRODUCTION

1.1 The Problem

In combustion chamber development, designers are aided by experiments but, as a supplement to them, economical design and operation can be greatly facilitated by the availability of prior predictions of the flowfield. These may be obtained by use of a mathematical model incorporating a numerical finite difference prediction procedure. This work combines the rapidly developing fields of theoretical combustion aerodynamics and computational fluid dynamics, and its improvement and use will significantly increase understanding and reduce the time and cost of development.¹⁻⁶

The present research work is concerned with complementary experimental and theoretical studies and is described in a recent paper.⁷ The problem being investigated is restricted to steady turbulent flow in axisymmetric geometries, under low speed and nonreacting conditions - a study area highlighted recently⁸⁻¹⁰ as a fundamental research requirement in combustion modeling. The particular problem is concerned with turbulent flow of a given turbulence distribution in a round pipe entering an expansion into another round pipe, as illustrated in Fig. 1. The in-coming flow may possess a swirl component of velocity via passage through swirl vanes at angle ϕ [equal approximately to $\tan^{-1}(w_{in}/u_{in})$], and the side-wall may slope at an angle α , to the main flow direction. The resulting flowfield domain may possess a central toroidal recirculation zone CTRZ in the middle of the region on the axis, in addition to the possibility of a corner recirculation zone CRZ near the upper corner provoked by the rather sudden enlargement of the cross-sectional area. Of vital concern is the characterization of flows of this type in terms of the effects of side-wall angle α , degree of swirl ϕ , turbulence intensity k_{in} of the inlet stream and expansion ratio D/d on the resulting flowfield in terms of its time-mean and turbulence quantities.

Such problems have received little attention, yet there is a definite need for work in this area even under nonreacting flow conditions.

The objective of the present document is to present details of the computational solution procedure which has been developed to perform the prediction function in the configuration just described. The finally developed computer program (written in Fortran 4) is code-named STARPIC (mnemonic for swirling turbulent axisymmetric recirculating flows in practical isothermal combustor geometries) and it is the purpose of this document to serve as a user's manual and describe it in sufficient detail for it to be used and amended by persons whose interest is confined more to the basis and results of the computations.

1.2 Previous Work

A mathematical solution of the flowfield of interest should provide results, if possible more cheaply, quickly, and correctly than possible by other means (for example, experiments on real-life systems or models). In order to achieve this, the model should simulate the flow in all its important respects (geometry, boundary conditions, physical properties of gases, turbulence, etc.) and provide a means whereby the governing equations may be solved. Mathematical models of steadily increasing realism and refinement are now being developed, both in the dimensionality of the model (together with the computational procedures) and in problems associated with the simulation of the physical processes occurring. Clearly there are two areas of difficulty: the simulation and solution.

Several previous publications discuss these problems at length, in terms of practical application,^{5,6} turbulence modeling^{11,12} and numerical solution of 2-D axisymmetric problems via the stream function ~ vorticity or primitive pressure ~ velocity approach.¹³⁻¹⁵ Whereas the former approach, used in the 1968 computer program from Imperial College for example¹⁶, reduces by one

the number of equations to be solved and eliminates the troublesome pressure (at the expense of trouble with the vorticity equation), the preferred approach now is SIMPLE (mnemonic for semi-implicit method for pressure linked equations) which focuses attention directly on the latter variables. Because it possesses many advantages, the present work has been developed immediately on this new technique, the basic ideas of which have been embodied into the 1974 Imperial College TEACH (teaching elliptic axisymmetric characteristics heuristically) computer program.¹⁷ Advances to this code have been made elsewhere and applied to other 2-D¹⁸⁻²⁵ and 3-D²⁶⁻²⁹ problems of interest to the combustor designer.

1.3 Outline of the Present Contribution

The present document serves as a user's manual for the STARPIC computer program, with three subsequent major sections dealing with the basic ideas, the computer program and the user's guide. Consideration is given to recent work in the finite difference solution, via a primitive variable code, of axisymmetric swirl flow in the combustor geometry of Fig. 1, where the inlet expansion sidewall may slope obliquely to the central axis. Section 2 describes the mathematical problem, by providing the basic equations and assumptions for the flow, and discussing the primitive variable solution technique to be used. Section 3 concerns itself with the organization and structure of the computer program. Sub-sections of the program are here described and linked with the equations previously noted in the text; and explanations are given of the special features of the program. Readers primarily interested in using the program, without concerning themselves greatly with the computational details, can give their main attention to Section 4. This is a user's guide to the program and the emphasis is on those parts of the program which will require alteration to suit particular flow configura-

tions, to obtain the desired output, to test for accuracy and to improve it when necessary. Appendices are provided dealing with the hybrid differencing scheme and reasons for its superiority, a Fortran symbol list, a listing of the STARPIC computer program, The program output is included in a microfiche supplement at the back of the report.

2. THE MATHEMATICAL PROBLEM

2.1 The Governing Equations

The turbulent Reynolds equations for conservation of mass, momentum (in x, y and θ directions), turbulence energy k and turbulence dissipation rate ϵ , which govern the 2-D axisymmetric, swirling, steady flow may be taken as previously.¹⁹⁻¹⁵ The transport equations are all similar and contain terms for convection and diffusion (via turbulent flux terms) and source S_ϕ of a general variable (which contains terms describing the generation (creation) and consumption (dissipation) of ϕ). Introducing turbulent exchange coefficients and the usual turbulent diffusion-flux (stress ~ rate of strain type) laws, it can be shown that the similarity between the differential equations and their diffusion relations allows them all to be put in the common form:

$$\frac{1}{r} \left[\frac{\partial}{\partial x} (\rho u r \phi) + \frac{\partial}{\partial r} (\rho v r \phi) - \frac{\partial}{\partial x} (r \Gamma_\phi \frac{\partial \phi}{\partial x}) - \frac{\partial}{\partial r} (r \Gamma_\phi \frac{\partial \phi}{\partial r}) \right] = S_\phi \quad (1)$$

for $\phi = 1$ (continuity equation), u, v, w (three velocity components), k and ϵ (two turbulence quantities). The forms for the source term S_ϕ are given in Table 1, where certain quantities are defined as follows:

$$S^u = \frac{\partial}{\partial x} (\mu \frac{\partial u}{\partial x}) + \frac{1}{r} \frac{\partial}{\partial r} (r \mu \frac{\partial v}{\partial x}) \quad (2)$$

$$S^v = \frac{\partial}{\partial x} (\mu \frac{\partial v}{\partial r}) + \frac{1}{r} \frac{\partial}{\partial r} (r \mu \frac{\partial v}{\partial r}) \quad (3)$$

$$G = \mu \left[2 \left\{ \left(\frac{\partial u}{\partial x} \right)^2 + \left(\frac{\partial v}{\partial r} \right)^2 + \left(\frac{v}{r} \right)^2 \right\} + \left(\frac{\partial u}{\partial r} + \frac{\partial v}{\partial x} \right)^2 + \left\{ r \frac{\partial}{\partial r} (w/r) \right\}^2 + \left(\frac{\partial w}{\partial x} \right)^2 \right] \quad (4)$$

Implicit here is the use of the two-equations k- ϵ turbulence model^{11,12}

Table 1. The Form of the Source Term in the General Equation for ϕ (Eq. (1))

ϕ	S_ϕ
u	$-\frac{\partial p}{\partial x} + S^u$
v	$-\frac{\partial p}{\partial r} + \frac{\rho w^2}{r} - \frac{2\mu v}{r^2} + S^v$
w	$-\frac{\rho v w}{r} - \frac{w}{r^2} \frac{\partial}{\partial r} (r\mu)$
k	$G - C_D \rho \epsilon$
ϵ	$(C_1 \epsilon G - C_2 \rho \epsilon^2)/k$

$$\mu = C_{\mu} \rho k^2 / \epsilon + \mu_l \quad (5)$$

$$\Gamma_{\phi} = \mu / \sigma_{\phi} \quad (6)$$

which is commonly used in computer codes for turbulent flow prediction.

These equations have to be solved for the time-mean pressure p and velocity components u , v , and w . Then other useful designer information like streamline plots showing breakaway and reattachment points, recirculation zones and stagnation points are easily produced. Streamline plots are obtained from the dimensionless stream function which is given by

$$\psi^* = \int_0^r u r dr / \int_0^{d/2} u r dr \quad (7)$$

This quantity is calculated for all u -cells, and the coordinates of points constituting each of eleven streamlines ($\psi^* = 0.0$ through $\psi^* = 1.0$) is stored for plotting. Earlier publications¹⁷⁻²¹ provide details of the present simulation and solution technique, and only highlights of the primitive-variable approach need be given here in the context of the specific problem being investigated.

All the linkages provide a high degree of non-linearity in the total problem, and given the numerical analysis of fluid flow its peculiar difficulty and flavor. The above equations do not alone specify the problem; additional information of two kinds is needed: initial and boundary conditions for all the dependent variables. Details of this are given in Section 2.3. The difficulties in solution spring mainly from the interlinkages between the ϕ 's. Those between the axial and radial velocity components are of a peculiar kind, each containing an unknown pressure

gradient and the components are linked additionally by another equation, that of mass conservation, in which pressure does not appear. A successful solution procedure is one which takes account of these interactions and ensures that successive adjustments, which must be made to one variable after another, form an involuntary convergent sequence.

2.2 The Solution Technique and Finite Difference Formulation

Solution may be via the stream function-vorticity or primitive pressure-velocity approach, and, as discussed in Section 1.2, the present solution technique is based on the latter. The basic TEACH computer program using SIMPLE with TDMA provides the starting point upon which the present work is based.¹⁷ The following features are incorporated into the program:

- (i) a finite difference procedure is used in which the dependent variables are the velocity components and pressure;
- (ii) the pressure is deduced from an equation which is obtained by the combination of the continuity equation and the momenta equations (yielding a new form of what is known in the literature as the Poisson equation for pressure);
- (iii) the idea is present at each iteration of a first approximation of u , v , and p followed by a succeeding correction;
- (iv) the procedure incorporates displaced grids for the axial and radial velocities u and v , which are placed between the nodes where pressure p and other variables are stored; and
- (v) an implicit line-by-line relaxation technique is employed in the solution procedure (requiring a tridiagonal matrix to be inverted in order to update a variable at all points along a column), using the TDMA (tri-diagonal matrix algorithm).

The incorporation of these enhances the accuracy and rapidity of convergence

of the finally developed computer program.

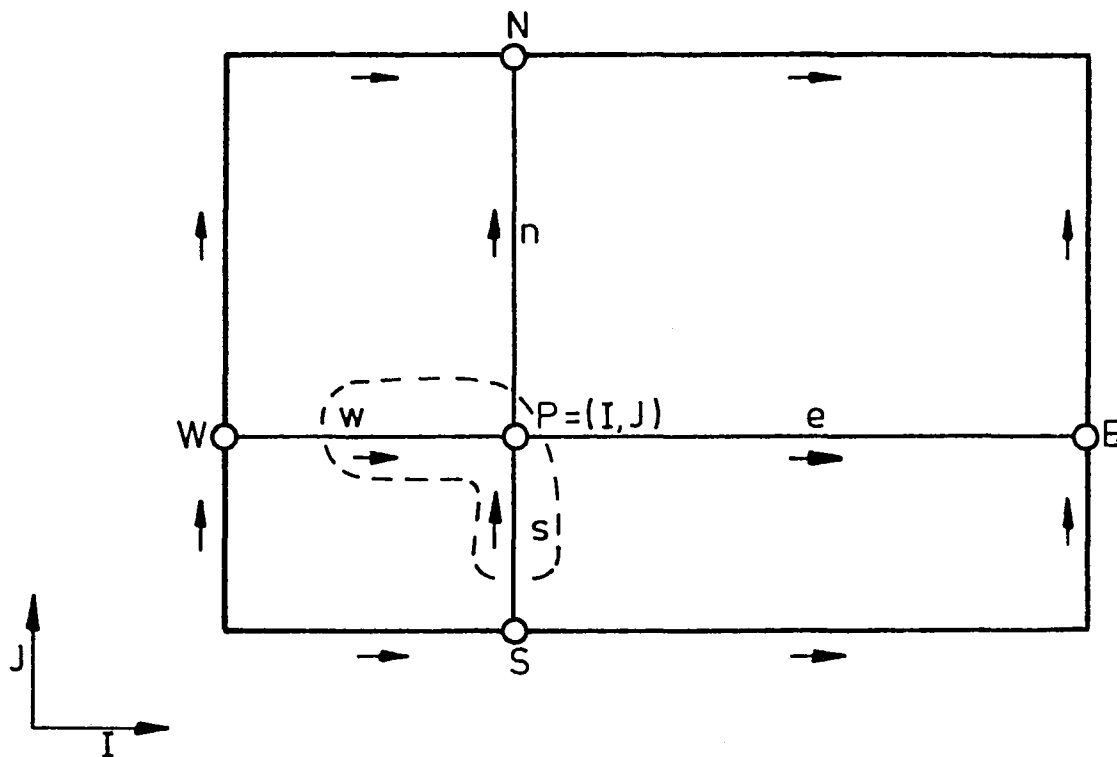
The finite difference equations are solved on a complex mesh illustrated in Fig. 2. The intersections, the point P for example, of the solid lines mark the grid nodes where all variables except the u and v velocity components are stored. The latter are stored at points which are denoted by arrows (and labeled w and s respectively) located midway between the grid intersections, and the boomerang-shaped envelope encloses a triad of points with reference location P at (I,J). Details of the special merits of this staggered grid system have been reported previously^{17,18} The different control volumes C, U and V which are appropriate for the P, w and s locations respectively are given in Fig. 3.

The finite difference equations for each ϕ are obtained by integrating Eq. (1) over the appropriate control volume (centered about the location of ϕ) and expressing the result in terms of neighboring grid point values. The convection and diffusion terms become surface integrals of the convection and diffusive fluxes while the source term is linearized, resulting in

$$\begin{aligned} & [\rho u \phi - \Gamma_{\phi} \frac{\partial \phi}{\partial x}]_e A_e - [\rho u \phi - \Gamma_{\phi} \frac{\partial \phi}{\partial x}]_w A_w \\ & + [\rho v \phi - \Gamma_{\phi} \frac{\partial \phi}{\partial r}]_n A_n - [\rho v \phi - \Gamma_{\phi} \frac{\partial \phi}{\partial r}]_s A_s = [S_p \phi_p + S_U] Vol \end{aligned} \quad (8)$$

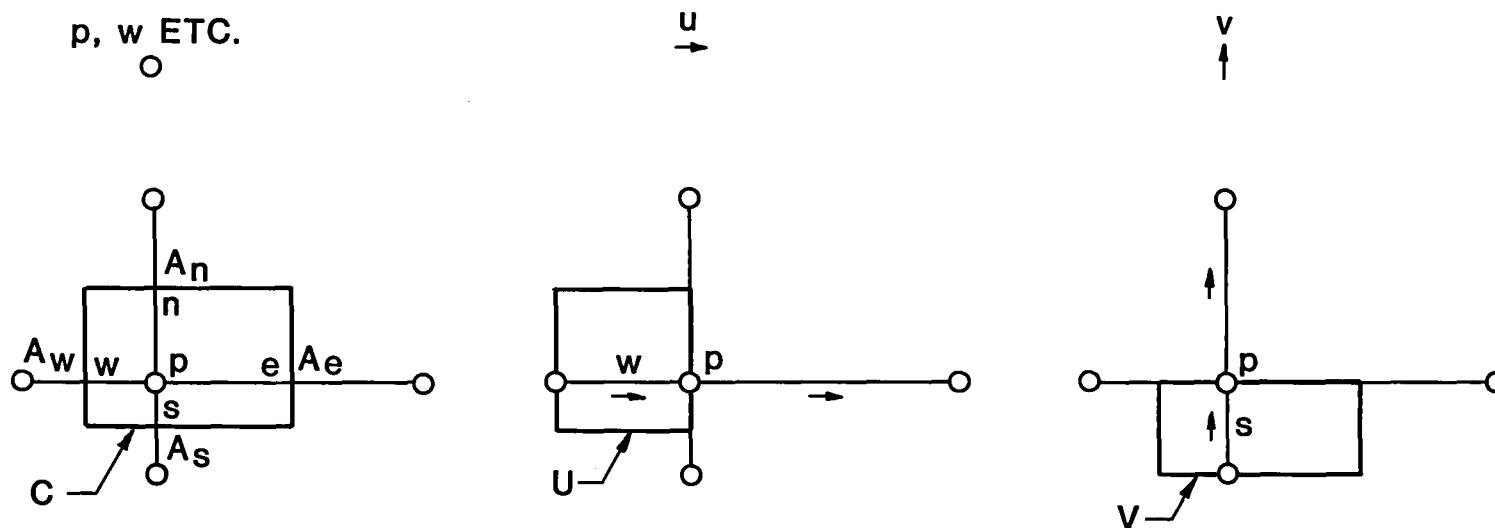
where S_p^{ϕ} and S_U^{ϕ} are tabulated in Table 2 and subscripts n, s, e and w refer to north, south, east and west cell faces.

The additional source terms in the equations for swirling flows may induce instability if one is not careful. Only terms which are always negative are permitted in the SP(I,J) expression in order to aid the convergence of the iterative solution procedure by increasing the diagonal dominance of the equation set to be solved at each iteration. Inspection of the arrangement given in Table 2 reveals that the forms given enjoy this desirable stabilizing



THREE GRIDS : FOR p , w ETC. - AT POSITION MARKED (O)
 FOR u VELOCITY - AT POSITION MARKED (→)
 FOR v VELOCITY - AT POSITION MARKED (↑)

Fig. 2. Staggered grid and notation for the rectangular computational mesh.



CONTROL VOLUMES C, U, V FACE
AREAS A_n , A_s , A_e AND A_w FOR C, SIMILAR FOR U AND V

Fig. 3. The three control volumes associated with points of the three
grids.

Table 2. The Form of the Components of the Linearized Source Term*, The Cell Volume Integral $\int_V S_\phi dV = S_P^\phi \phi_P + S_U^\phi$ of Eq. (1).

ϕ	Γ_ϕ	S_P^ϕ/V	S_U^ϕ/V
1	0	0	0
u	μ	0	$S^u - \frac{\partial P}{\partial x}$
v	μ	$-2\frac{\mu}{r^2}$	$S^v + \frac{\rho w^2}{r} - \frac{\partial P}{\partial r}$
w	μ	0	$-\frac{\rho v w}{r} - \frac{w}{r^2} \frac{\partial}{\partial r} (r\mu)$
k	μ/σ_k	$-C_\mu C_D \rho^2 k/\mu$	G
ϵ	μ/σ_ϵ	$-C_2 \rho \epsilon/k$	$C_1 C_\mu G \rho k/\mu$

In this table certain quantities are defined as follows:

$$S^u = \frac{\partial}{\partial x} \left(\mu \frac{\partial u}{\partial x} \right) + \frac{1}{r} \frac{\partial}{\partial r} \left(r\mu \frac{\partial v}{\partial x} \right)$$

$$S^v = \frac{\partial}{\partial x} \left(\mu \frac{\partial u}{\partial r} \right) + \frac{1}{r} \frac{\partial}{\partial r} \left(r\mu \frac{\partial v}{\partial r} \right)$$

$$G = \mu \left[2 \left\{ \left(\frac{\partial u}{\partial x} \right)^2 + \left(\frac{\partial v}{\partial r} \right)^2 + \left(\frac{v}{r} \right)^2 \right\} + \left(\frac{\partial u}{\partial r} + \frac{\partial v}{\partial x} \right)^2 + \left\{ r \frac{\partial}{\partial r} \left(\frac{w}{r} \right) \right\}^2 + \left(\frac{\partial w}{\partial x} \right)^2 \right]$$

*In this table, V stands for the cell control volume and $\mu \equiv \mu_{\text{eff}}$.

characteristics. A false source stabilizing trick, which has no effect on the final solution, is used in the form of a false source of magnitude:

$$S_{\text{false}} = |\dot{m}_{\text{net}}| (\phi_P^{\text{old}} - \phi_P) \quad (9)$$

That is used in the program although not detailed in Table 2.

For the representation of the convective and diffusive terms over the cell control volume surfaces a hybrid scheme is used,³⁰ which is a combination of the so-called central and upwind differences. Consider the transport across one face of a control volume. Figure 4 shows the western face of area A_W normal to the x-direction, which lies midway between the grid-points W and P distant δx apart. The contribution c_W to the surface integral by the western face area A_W , for example, is given by

$$c = \begin{cases} (\rho u)_W A_W (\phi_W + \phi_P)/2 - (\Gamma_\phi)_W A_W (\phi_P - \phi_W)/\delta x & \text{for } |Pe| < 2 \\ (\rho u)_W A_W \phi_W & \text{for } Pe \geq 2 \\ (\rho u)_W A_W \phi_P & \text{for } Pe \leq -2 \end{cases} \quad (10)$$

where $Pe = (\rho u)_W \delta x / (\Gamma_\phi)_W$ is a cell Peclet number calculated at the western face of the cell. Similar expressions are used at the other three faces of the cell. Details regarding the derivation and superiority of this differencing technique may be found in Appendixes A, B and C.

When the various terms are handled in this manner the following general equation is obtained:

$$a_P^\phi \phi_P = \sum_j a_j^\phi \phi_j + S_U^\phi \quad (11)$$

$$\text{where } a_P^\phi = \sum_j a_j^\phi - S_P^\phi$$

\sum_j = sum over N, S, E and W neighbors

thus linking each ϕ -value at a point P with its four neighboring values.

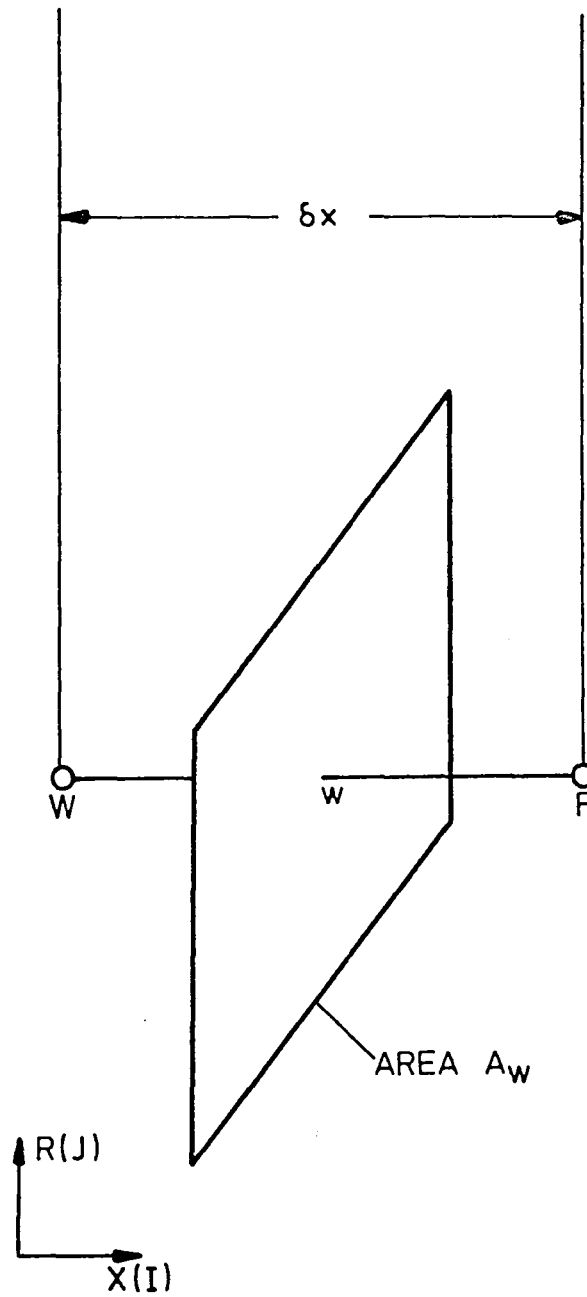


Fig. 4. One face of a control volume across which convective and diffusive fluxes are considered.

When $\phi = W, k$ and ϵ , equations of this type hold for values located at intersections of the grid system, but for $\phi = u$ and v there are two points of difference: (i) these variables are located to the west and south respectively of the point P and (ii) pressure gradient terms $\partial p/\partial x$ and $\partial p/\partial r$ respectively occur on the right hand side of their equations in addition to the usual source expression. Since the pressure field is not known when the u and v equations are required to be used at any stage of the iteration process, the best estimate so far of the pressure field p^* is used. Solving the u and v equations with this p^* field gives estimates u^* and v^* in the flowfield. These p^*, u^* and v^* fields constitute any any iteration stage a first approximation to the solution and they are immediately followed by a succeeding correction at each point P :

$$p_P = p_P^* + p_P' \quad (12)$$

$$u_P = u_P^* + D^u(p_W' - p_P') \quad (13)$$

$$v_P = v_P^* + D^v(p_S' - p_P') \quad (14)$$

where $D^u = A_W/a_P^u$

$$D^v = \frac{1}{2}(A_n + A_s)/a_P^v$$

These corrections can be applied only after the pressure correction p' field has been found and this is obtained from a Poisson equation for pressure which may be deduced from a combination of the continuity and momentum equations, resulting in finite difference equations like

$$a_P^p p_P' = \sum_j a_j^p p_j' + s_U^p \quad (15)$$

where $a_p^p = \sum_j a_j^p$

\sum_j = sum over N, S, E and W neighbors

s_u^p = term which results from mass sources of u^* and v^* fields.

Thus the application of Eqs. (13) and (14) at any iteration stage brings the first approximation obtained from solution of momentum equations into line with the requirement of continuity - it is here where the continuity equation is used, incorporated in fact in the derivation of the equation for p' , Eq. (15).

2.3 Boundary Conditions

There are several methods of numerically positioning an irregular boundary, such as a sloping boundary segment, in finite difference computer programs. In order to retain conceptual simplicity, the stairstep simulation shown in Fig. 5 is utilized. The figure shows an example of grid specification for the geometry under consideration. The flowfield is covered with a nonuniform rectangular grid system. Typically the boundary of the solution domain falls halfway between its immediate nearby parallel gridlines. Clearly, specification of the x and r coordinates of the gridlines, together with information concerned with the position of the sloping sidewall boundary (via specification of $JMAX(I)$ for each I) is sufficient to determine the flowfield of interest.

Up to this point the application of boundary conditions has not yet been considered, and the formulation has been concerned with regular internal mesh points. Insertion of correct boundary conditions requires amendment of the finite difference formulation for the near boundary points.¹⁶ For cells

adjacent to the west wall for example, as shown in Fig. 6, there is no convective flux through the cell west boundary which is coincident with an impervious wall. Hence the term for total ϕ -flux through this cell boundary in Eq. (8) is set to zero, and the diffusive flux term $\Gamma_\phi \partial\phi/\partial x$ is transferred to the right-hand side of the equation as a false source. In the case of a western wall boundary the normal P-W link is broken by setting:

$$a_W^\phi = 0 \quad (16)$$

and the correct expression is inserted by way of the S_U^ϕ and S_P^ϕ values:

- (i) If a value M for the diffusion terms $\Gamma_\phi \partial\phi/\partial x$ is specified for the western face of a cell adjacent to a western wall, then as seen in Eq. (8):

$$S_U^\phi = -M/\text{Vol} \quad (17)$$

$$S_P^\phi = 0 \quad (18)$$

It is clear that this specification results in correct ϕ balance for the boundary cell, and that if zero normal gradient is the required condition ($M = 0$) then Eq. (16) is sufficient in itself.

- (ii) If the value of ϕ on the boundary ϕ_B is specified, for a western boundary for example, then:

$$S_U^\phi = a_W' \phi_B \quad (19)$$

$$S_P^\phi = -a_W' \quad (20)$$

where

$$a_W' = (\Gamma_\phi)_W A_W / \delta x$$

It is clear that this specification gives the correct gradient-diffusion flux out of the western boundary of the cell.

(iii) If ϕ_p is required to be fixed at a value of ϕ_F then:

$$S_U^\phi = \phi_F \cdot 10^{30} \quad (21)$$

$$S_p^\phi = -10^{30} \quad (22)$$

to that these terms dominate in the equation for ϕ_p with solution $\phi_p = \phi_F$.

- (iv) Velocities tangential to a wall boundary usually have boundary conditions of the type v_B given, τ_B (= tangential shear stress) given, or $\tau_B = \alpha v_p + \beta$ (from drag law for example). Any of these may be inserted by the usual treatment (break link and insert via linearized source).
- (v) Velocities normal to a wall boundary are given zero values on the wall, but because this leads to incorrect gradient calculations for the first interior point away from the wall, zero normal gradient conditions are applied via breaking the appropriate coupling coefficient in the finite difference equation for this first interior point.

The above discussion about boundary condition types (i) - (v) has been concerned with a western wall boundary shown in Fig. 6. Analogous discussion is appropriate with a northern wall boundary shown in Fig. 7.

Conditions must be specified on the entire boundary around the solution domain, and special novelties concern the pressure correction p' , velocity components and the two turbulence quantities k and ϵ . At the inlets all variables are given definite fixed values (Dirichlet conditions) and at the outlet all variables are given zero normal gradient $\partial\phi/\partial x = 0$ (Neumann conditions) via

$$a_E^\phi = 0 \quad (23)$$

except radial velocity v which is set to zero.

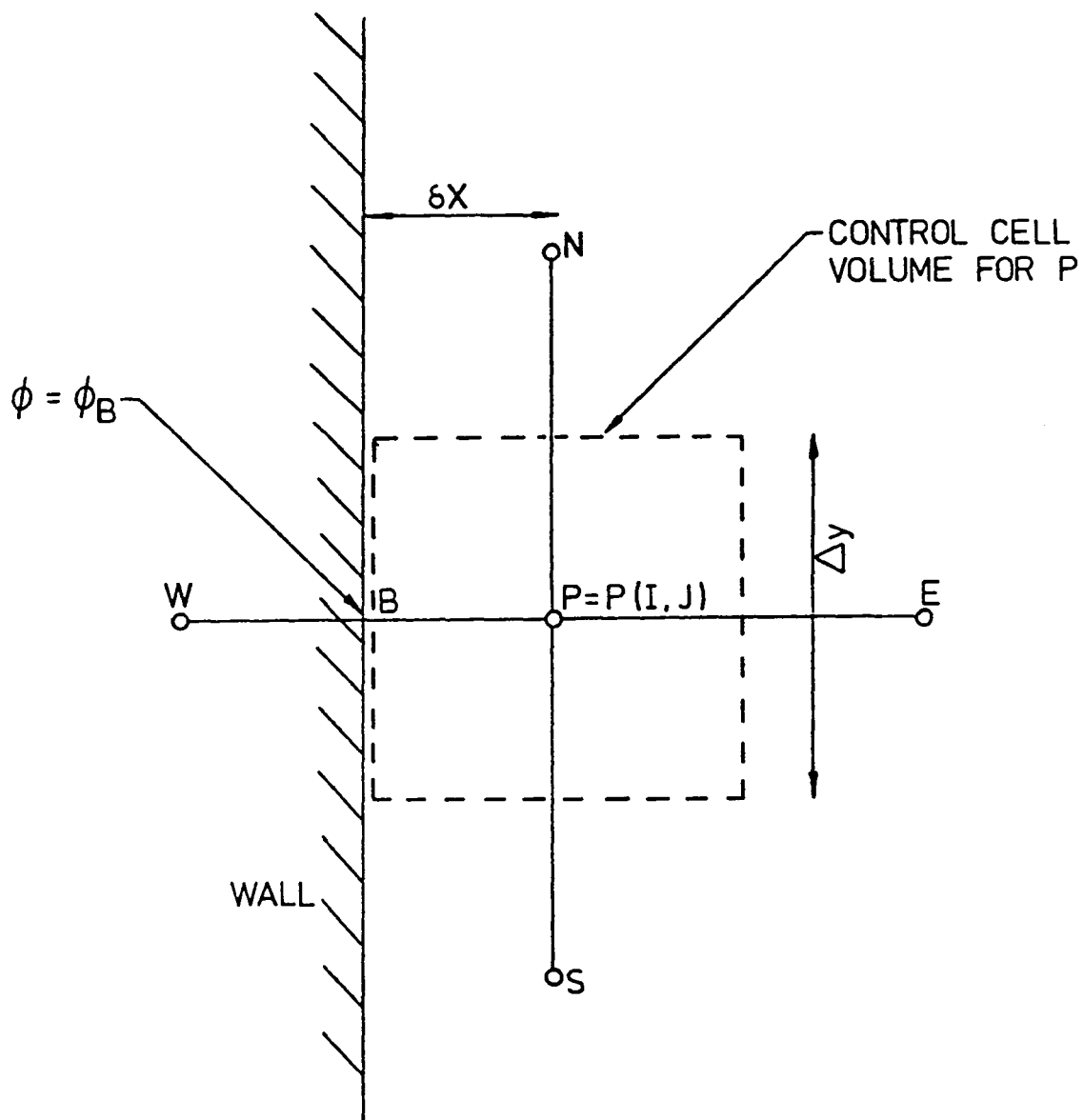


Fig. 6. Wall ϕ -value prescription for western wall.

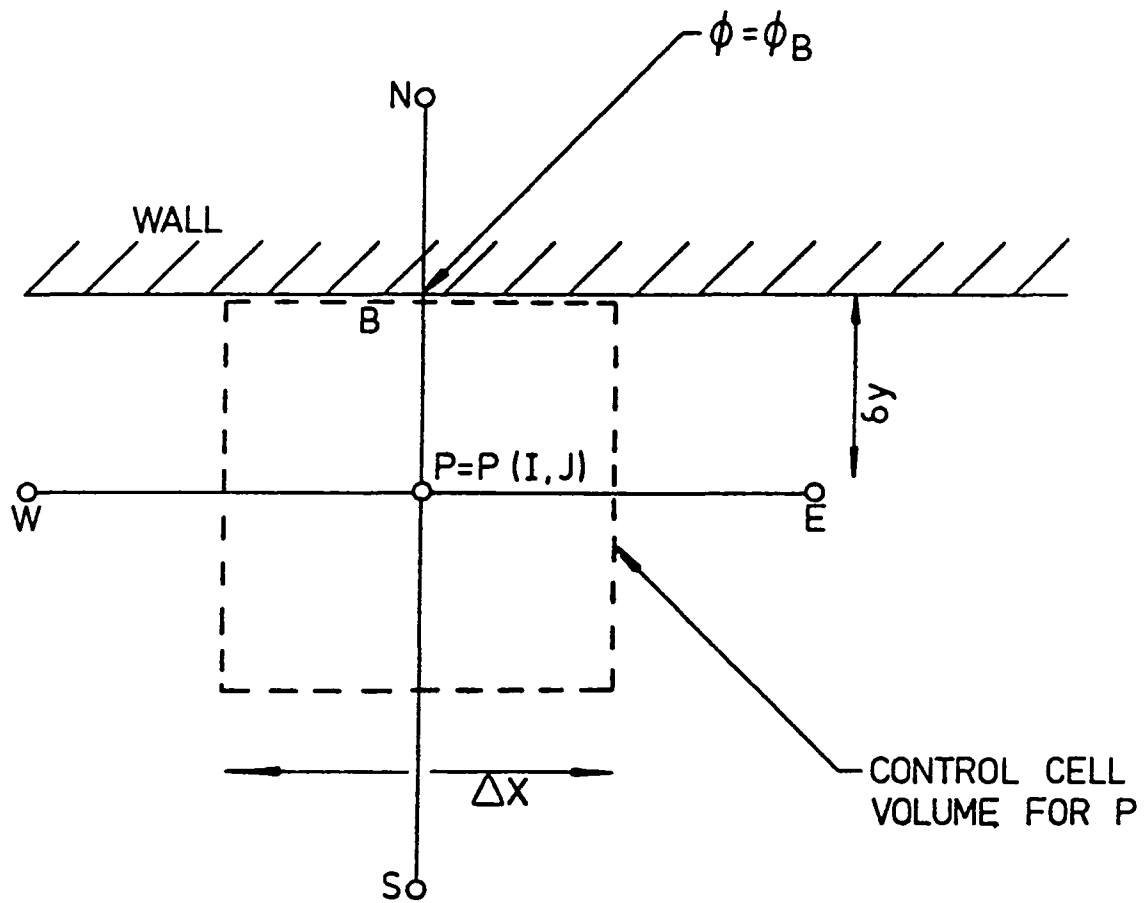


Fig. 7. Wall ϕ -value prescription for northern wall.

The u velocities are then readjusted slightly at each iteration so as to ensure overall mass conservation as compared with the inlet flow. At the symmetry axis $\partial\phi/\partial r = 0$ is assumed for all variables except v (which is given a definite zero value) and w (which is given an implied zero value as follows. Based on measurements³¹ of swirl velocity, the BC for w along the centerline specifies solid body rotation through linear interpolation of $w(I,2)$ between the latest value of $w(I,3)$ and zero for w on the centerline. Also p' is given zero normal gradient specification everywhere except at the inlet, where it has zero value: as far as the aerodynamics is concerned it is immaterial what the absolute pressure is, only pressure gradients entering the equations.

2.4 Wall Functions and the Effect of Swirl

To avoid the need for detailed calculations in the nearwall regions, equations are introduced to link velocities, k and ϵ on the wall to those in the logarithmic region. This one-dimensional Couette flow characterization of the flow (diffusion perpendicular to the wall is dominant) is extremely useful. Also it provides a way around this region of steep nonlinear variation of the variables and the fact that laminar and turbulent effects become of the same order of magnitude. The new equations introduced, called 'wall functions', are introduced and used in the finite difference calculations at near-wall points. They occur in the momenta equations and k -generation terms, and their implementation is discussed elsewhere^{11,12} together with appropriate near-wall ϵ specification.

The effect of swirl on wall function specification is handled as follows: The previous ideas are extended to find total tangential wall shear stress near boundaries [involving x and θ directions for an $r = \text{constant}$ wall, and r and θ directions for an $x = \text{constant}$ wall]. Then appropriate

components are deduced directly [for the u and w velocities which are tangential to an $r = \text{constant}$ wall, and v and w velocities which are tangential to an $x = \text{constant}$ wall]. The effects on u , v and w momentum equations are incorporated via the usual linearized source technique.

Northern Wall. The applicability of wall function formulations for swirl flows, especially for swirl momentum, appears uncertain a priori. However, from boundary layer velocity measurements in turbulent, swirling, pipe flows Backshall and Landis³¹ showed that total tangential velocity near the northern top wall $V = (u^2 + w^2)^{1/2}$ is correlated by the universal velocity profile

$$V^+ = (1/\kappa) \ln (E Y^+) \quad (24)$$

where κ and E are constants. The dimensionless total velocity V^+ and total distance Y^+ are obtained by nondimensionalizing with respect to the total shear velocity $(\tau_t/\rho)^{1/2}$. Hence the total tangential north wall shear stress $\tau_t = (\tau_{rx}^2 + \tau_{r\theta}^2)^{1/2}$ is obtained from

$$V(\tau_k \rho)^{1/2} / \tau_t = (1/\kappa) \ln [E y (\tau_k / \rho)^{1/2} / \nu] \quad (25)$$

where τ_k is an approximation for τ_t very near the wall. The quantity τ_k is formulated by observing that convection and diffusion of turbulence kinetic energy are nearly always negligible in this region.¹¹ Deleting these terms from the k -transport equation and invoking isotropic viscosity μ_{eff} leads to the result

$$\tau_k = (C_D C_\mu)^{1/2} \rho k \quad (26)$$

Thus one obtains

$$\tau_t = - V_p \kappa \rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_p^{\frac{1}{2}} / \ln(E Y_p^+) \quad (27)$$

where the negative sign is inserted since τ_t and V_p must have opposite directions. The quantities with subscript P are evaluated at the appropriate near-wall points as shown in Fig. 7 for this case of a northern wall.

The north wall diffusion flux for the x-momentum equation is $\mu_{\text{eff}} \partial u / \partial r$. The τ_{rx} component of τ_t is given by

$$\tau_{rx} = \mu_{\text{eff}} \left(\frac{\partial u}{\partial r} + \frac{\partial v}{\partial x} \right) \quad (28)$$

however $\partial v / \partial x$ approaches zero near the north wall.¹⁷ Hence τ_{rx} is the required diffusion flux term to be included as a false source for north wall u-cells; its wall function expression asserts the required boundary influence by indirectly incorporating the boundary condition $u_B = 0$. The above wall function formulation, Eq. (27), is multiplied by the factor $\cos \theta$ ($= u/V$) to obtain τ_{rx} . where θ is the angle between the total tangential velocity vector near the wall and the axial velocity vector ($\theta = \arctan w/u$). This is valid since θ is essentially constant near the wall.³²

Thus this wall function for u is

$$\mu_{\text{eff}} \frac{\partial u}{\partial r} = [-\kappa \rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_p^{\frac{1}{2}} / \ln(E Y_p^+)] u_p \quad (29)$$

which is precisely the same expression found for nonswirling flows in TEACH, although different values result due to swirl effects on k_p . Also, this result is consistent with an expression obtained by Date.³³

For w-cells along the north wall, the diffusion is $\mu_{\text{eff}} \partial w / \partial r$. This quantity appears in the expression for $\tau_{r\theta}$ which is

$$\tau_{r\theta} = \mu_{\text{eff}} \left(\frac{\partial w}{\partial r} - \frac{w}{r} \right) \quad (30)$$

Applying the factor $\sin \theta (=w/V)$ to the τ_t wall function yields the following expression for $\tau_{r\theta}$:

$$\tau_{r\theta} = [-\kappa \rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}} / \ln(E Y_P^+)] w_P \quad (31)$$

Hence the north wall function for w is given by

$$\mu_{\text{eff}} \frac{\partial w}{\partial r} = [-\kappa \rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}} / \ln(E Y_P^+)] + \mu_{\text{eff}} / r] w_P \quad (32)$$

Western wall. Momentum wall functions along the west wall are similarly formulated. The total tangential velocity is now $V = (v^2 + w^2)^{1/2}$, and τ_{xr} reduces to $\mu_{\text{eff}} \partial v / \partial x$. Equation (27) for τ_t is again obtained and the τ_{xr} wall function is formulated by employing the factor $\cos \phi$; ϕ is the angle between the total tangential velocity vector and the radial velocity vector ($\phi = \arctan w/v$). Thus one obtains the v-momentum expression:

$$\mu_{\text{eff}} \frac{\partial v}{\partial x} = [-\kappa \rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}} / \ln(E Y_P^+)] v_P \quad (33)$$

The w-equation wall function on the western wall approximates $\mu_{\text{eff}} \partial w / \partial x$, which is $\tau_{x\theta}$. Here the factor $\sin \phi$ is used to obtain the necessary wall function as

$$\mu_{\text{eff}} \frac{\partial w}{\partial x} = [-\kappa \rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}} / \ln(E Y_P^+)] w_P \quad (34)$$

Other details. In accordance with Gosman and Pun,¹⁷ if Y^+ for a cell adjacent to any solid boundary is less than 11.63, it lies within the laminar sublayer where the laminar viscosity dominates. Hence, the wall function employed for north wall u-cells, for example, is

$$\mu_{\text{eff}} \frac{\partial u}{\partial r} = -\mu_{\ell} u_p / \delta_p \quad (35)$$

where $u_B = 0$ has been employed. Similar expressions are analogously obtained for other momentum diffusion terms of the problem.

For turbulence energy, from Eq. (30)

$$k\rho/|\tau_B| = (C_{\mu} C_D)^{-\frac{1}{2}} = \text{constant} \quad (36)$$

near a solid boundary which implies that the wall flux is zero. Accordingly, zero normal gradient prescription for k is appropriate for wall cells via Eq. (16). Also the shear stress wall functions are employed for the k -generation source G for k -cells along a wall. The general expression for G , given in Table 2, can alternately be expressed as

$$G = 2\mu_{\text{eff}} \left[\left(\frac{\partial u}{\partial x} \right)^2 + \left(\frac{\partial v}{\partial r} \right)^2 + \left(\frac{v}{r} \right)^2 \right] + [\tau_{rx}^2 + \tau_{r\theta}^2 + \tau_{x\theta}^2] / \mu_{\text{eff}} \quad (37)$$

For north wall cells $\tau_t^2 = \tau_{rx}^2 + \tau_{r\theta}^2$ which yields

$$G = 2\mu_{\text{eff}} \left[\left(\frac{\partial u}{\partial x} \right)^2 + \left(\frac{\partial v}{\partial r} \right)^2 + \left(\frac{v}{r} \right)^2 \right] + \tau_t^2 / \mu_{\text{eff}} + \mu_{\text{eff}} \left(\frac{\partial w}{\partial x} \right)^2 \quad (38)$$

where the previous wall function expression for τ_t is employed. Similarly, the result for west wall cells is

$$G = 2\mu_{\text{eff}}\left[\left(\frac{\partial u}{\partial x}\right)^2 + \left(\frac{\partial v}{\partial r}\right)^2 + \left(\frac{v}{r}\right)^2\right] + \tau_t^2/\mu_{\text{eff}} + \mu_{\text{eff}}\left(\frac{\partial w}{\partial r} - \frac{w}{r}\right)^2 \quad (39)$$

where $\tau_t^2 = \tau_{xr}^2 + \tau_{x\theta}^2$.

As for energy dissipation, near a wall the length scale is assumed to be proportional to the normal distance from the wall which leads to

$$\epsilon = \frac{(C_\mu C_D)^{3/4}}{C_D \kappa} \frac{k_p^{3/2}}{\delta_p} \quad (40)$$

This is the effective wall boundary condition on ϵ and in the code this value is fixed for near wall points via the linearized source procedure, using Eqs. (21) and (22).

2.5 Boundary Conditions Summary

Table 3 summarizes the boundary values used in the present study, which are incorporated into the computer program. The symbol N in the table signifies that zero normal gradient prescription is appropriate.

Footnotes (a) to (g) are dealt with as follows:

- (a) Inlet values UIN etc. are directly specified and easily altered.
- (b) The axial velocities at the outlet are deduced from their immediate upstream values by adding a fixed amount of each of $U(NIM1, J)$ ($J = 1$ to $NJM1$); this amount is calculated to ensure overall mass conservation.
- (c) Near wall tangential velocities are connected with their zero wall values by way of the tangential shear stress wall functions.
- (d) Near-axis swirl velocity at $J = 2$ is fixed for solid body rotation in terms of the previous w at $J = 3$ and its zero value on the axis.
- (e) Outlet values of k and ϵ are unimportant because of the limited upstream influence at high Reynolds numbers and zero gradient is

Table 3. Boundary Conditions (N stands for zero normal gradient specified)

(Footnotes are detailed in section 2.3 of the text)

Algebraic Variable	Inlets ^(a)	Outlet	Top Wall	Side wall	Symmetry Axis
u	UIN	adjusted ^(b)	(c)	N	N
v	0	0	N	(c)	0
w	WIN	N	(c)	(c)	0 ^(d)
κ	TEIN	N ^(e)	N	N	N
ϵ	EDIN	N ^(e)	(f)	(f)	N
p	0 ^(g)	N	N	N	N

specified. If the local Peclet number is greater than +2, there is no upstream influence because of the implications of the hybrid formulation of convection and diffusion, and the downstream convection dominates.

- (f) Near wall ϵ values are fixed using the length scale near the wall and the current value of k .
- (g) The pressure correction p' possesses zero normal gradient specification everywhere except the inlet. Just one internal pressure p specification at (2,2) is then required to allow all the pressures to be calculated.

This concludes the discussion of boundary condition specification; its implementation is returned to in Section 4 of the present text.

2.6 Solution Procedure

The finite difference equations and boundary conditions constitute a system of strongly-coupled simultaneous algebraic equations. Though they appear linear they are not since the coefficients and source terms are themselves functions of some of the variables, and the velocity equations are strongly linked through the pressure. The solution proceeds by the cyclic repetition of the following steps:

- (i) Guess the values of all variables including p^* . Hence calculate auxiliary variables like turbulent viscosity etc.
- (ii) Solve the axial and radial momentum equations to obtain u^* and v^* from equations like Eq. (11).
- (iii) Solve the pressure correction equation, Eq. (15), to obtain p' .
- (iv) Calculate the pressure p and the corrected velocities u and v from Eqs. (12) through (14).
- (v) Solve the equations like Eq. (11) for the other ϕ 's successively.

- (vi) Treat the new values of the variables as improved guesses and return to step (i); repeat the process until convergence.

In the solution procedure algebraic equations like Eq. (11) are solved many times, coefficient and source updating being carried out prior to each occasion. The practice used here is to make use of the well-known tridiagonal matrix algorithm (TDMA), whereby a set of equations, each with exactly three unknowns in a particular order except the first and last which have exactly two unknowns, may be solved sequentially. One considers the values at grid-points along a vertical gridline to be unknown (values at P, N and S for each point P), but take as known, most recent values being used, the values at each E and W neighbor. The TDMA is then applied to this vertical gridline. In this manner one can traverse along all the lines in the vertical direction sequentially from left to right of the integration domain.

Two points clarify the solution technique regarding the stairstep sloping boundary. Firstly, interior points adjacent to the boundary must 'feel' the boundary in the usual way. Thus values in the external field must not be inadvertently picked up at these points. Usually the standard coupling coefficient of interest is set to zero and the wall effect given by way of a false source, according to the previous description. Secondly, if the TDMA is applied in columns over the entire 2-D array of points, the solution at external points can be automatically forced to zero by giving S_p^ϕ a very large negative value at these locations. This term then dominates in its finite difference equation at P with solution $\phi = 0$. Alternatively, the domain of TDMA execution can be restricted to the physically meaningful portion of the 2-D array of points. The latter technique is incorporated into the present computer code.

At each iteration it is necessary to employ some degree of under-relaxation when solving equations like Eq. (11). A weighted average of the

newly calculated value and the previous value is taken at each point. If ϕ_p^{n+1} represents the newly calculated value of ϕ at the $n+1$ iteration, it is obtained from

$$a_p^\phi \tilde{\phi}_p^{n+1} = \sum_j a_j^\phi \phi_j^n + S_U^\phi \quad (41)$$

The notation and similarity to Eq. (11) is obvious and

$$\phi_p^{n+1} = f \tilde{\phi}_p^{n+1} + (1-f) \phi_p^n \quad (42)$$

where ϕ_p^{n+1} represents the underrelaxed value of ϕ_p , employing the no-relaxation value $\tilde{\phi}_p^{n+1}$ and the underrelaxation parameter f ($0 < f \leq 1$). Rather than calculate and store the $\tilde{\phi}_p^{n+1}$ values and then apply Eq. (42), it is more convenient to modify and use Eq. (41) directly in the form

$$(a_p^\phi/f) \phi_p^{n+1} = \sum_j a_j^\phi \phi_j^n + [S_U^\phi + (1-f) \frac{a_p^\phi}{f} \phi_p^n] \quad (43)$$

so that the underrelaxed value is calculated immediately. This is the version used in the present code.

The effect of underrelaxation factor values on convergence rate is considerable. Unacceptably slow convergence or divergence of the solution is obtained if the factors are too low or too high, respectively. Large pressure corrections arise which produce large u - and v -velocity corrections. If these corrections are too large per iteration, the nonlinearity of the FDEs causes divergence.

Velocity and pressure corrections per iteration become smaller as the solution proceeds toward convergence. Thus the underrelaxation factors (especially for u - and v -velocities) have small initial values, to prevent

divergence, and increase for faster convergence as the corrections become smaller. Hence the underrelaxation factors for u, v and w are increased linearly during the first 40 iterations.

Increased accuracy of the initial estimate of field variables clearly reduces the amount of computational work required. Also it yields a slower rate-of-variable change and smaller corrections for continuity, which promotes convergence.

Since the user generally desires to utilize such a computer code to solve a series of problems, as in a parametric study for example, he almost always has converged (or partially-converged) solutions from previous computer runs of a similar problem. By storing field values of all variables on disk upon convergence for each swirl loop, a much better initial estimate conveniently becomes available for corresponding swirl cases of future problems, or for more stringent convergence of the same problem.

Final convergence is decided by way of a residual-source criterion, which measures the departure from exactness for the variable ϕ at the point P. The residual sources are defined for each variable at each point by equations like

$$R_P^\phi = a_{P\phi}^\phi - \sum_j a_{j\phi}^\phi \phi_j - S_U^\phi \quad (44)$$

When each of these quantities becomes smaller than a certain fraction of a reference value, the finite difference equations are declared to be solved. Typically, the solution is considered to be converged if the cumulative sum of the absolute residuals throughout the field for all variables is less than 0.5 per cent of the inlet flow rate of the corresponding variable.

3. THE STARPIC COMPUTER PROGRAM

3.1 Outstanding Features

The case described. The computer program code described and listed performs the function outlined in Section 2 for the particular 2-D axisymmetric geometry shown schematically in Fig. 5. The flowfield is covered with a gradually expanding rectangular grid system. The quantity EPSX specifies the degree of grid expansion in the axial direction, and in the radial direction it is determined through specification of the radial position of each individual horizontal grid line. The boundary of the solution domain falls halfway between its immediate nearby parallel gridlines; and clearly specification of JMAX(I) for each I (see Fig. 5) is sufficient to determine the flowfield of interest. This provides a stairstep approximation to any monotonically increasing top wall radius as required so as to simulate any sudden expansion, sloping straight or curved sidewall. The code is equipped to handle any of these with ease. The program is an advanced version of a framework of ideas embodied into the 1974 Imperial College TEACH computer program,¹⁷ from which the present work has been developed. The following discussion is a commentary on the final developed program. A listing is supplied as Appendix E and should be read simultaneously with the discussion.

General arrangement. The STARPIC program (see the flow chart of Fig. 8) has been written (in Fortran 4) primarily with a view to maximizing simplicity and ease of amendment at the expense of computer time. This is achieved by limiting to the MAIN subprogram those features which characterize the particular flow conditions being investigated, while different boundary conditions may be inserted by way of the PROMOD (problem modifications) subroutine. The various functions of these and other subroutines are given briefly in Table 4 and in detail in sections 3.2 to 3.12. MAIN is the section of the

STARPIC

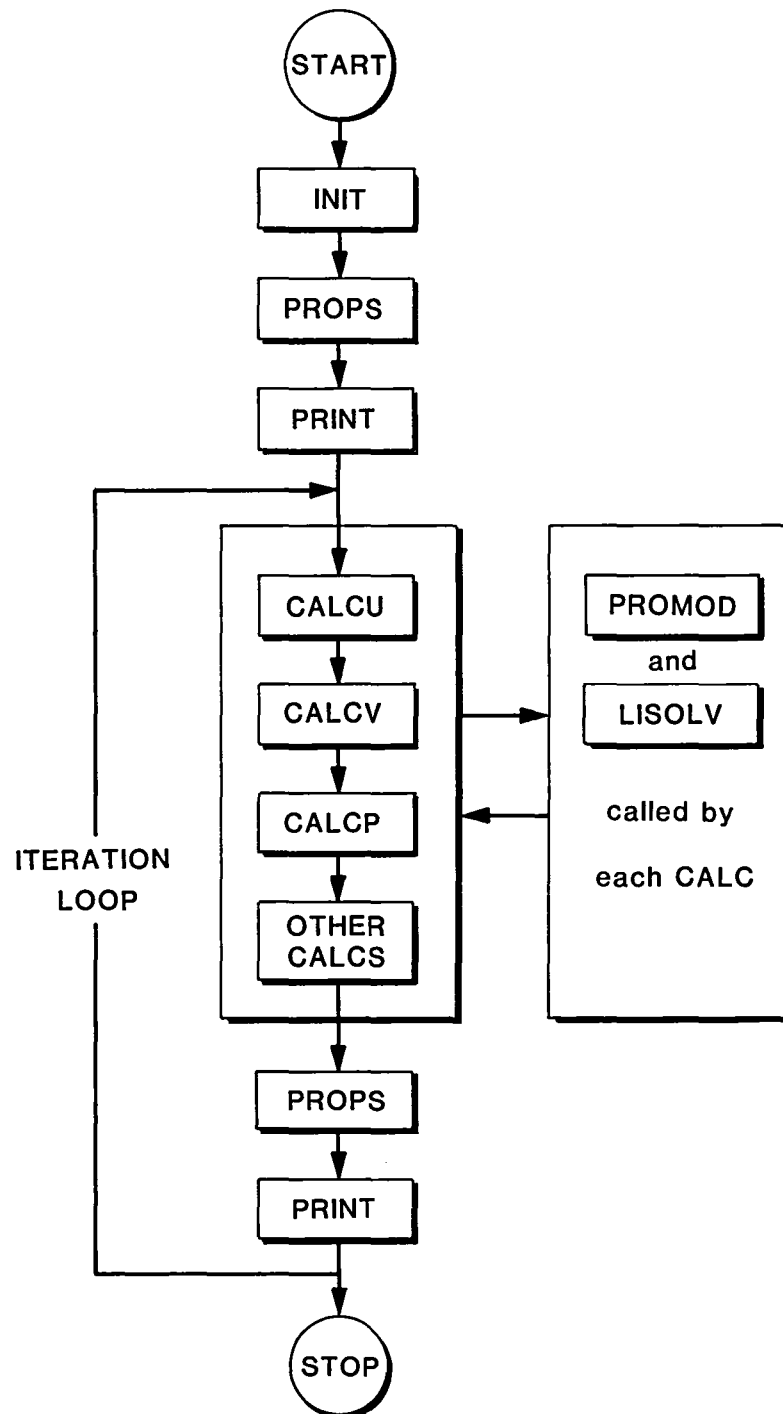


Fig. 8. Flow chart of computer program showing the subroutine arrangement.

Table 4. Subroutine Tasks

<u>Subroutine</u>	<u>Task</u>
MAIN	Controls and monitors the entire sequence of calculations: initialization, properties and initial output; the iteration loop with calls to update main variables, other mixture properties and intermediate output; and, after termination of the iteration loop, final output, an increment in inlet degree of swirl and a return to the beginning again.
INIT	Sets values to the numerous geometric quantities concerned with grid structure, see Figs. 9-11, and initializes most variables to zero or other reference value.
PROPS	Updates the fluid properties via calculation of turbulent viscosity, under-relaxed using its previous value. In nonisothermal flows, perhaps with chemical reaction, additional species' mass fractions, temperature and density are also calculated here, with an appeal to PROMOD (1) for any other modifications.
PRINT	Prints out an entire variable field according to a standard format.
CLACU and CALCV	Calculates coupling coefficients of finite difference equation for axial velocity u^* and radial velocity v^* , calls PROMOD (2) and PROMOD (3) for boundary modifications and LISOLV for entire field of variables to be updated to get u^* and v^* fields.

Table 4 (continued)

CALCP	Calculates coupling coefficients of finite difference equation for pressure correction p' ; calls PROMOD (4) for boundary modifications and LISOLV to obtain p' field. The subroutine closes with p^* , u^* and v^* being 'corrected' with p' , u' and v' .
Other CALC Subroutines	Calculates coupling coefficients of appropriate finite difference equation, calls appropriate part of PROMOD and then LISOLV for complete update of the variable in question.
PROMOD	Modifies the values of the finite difference equation coefficients, or the variables, near walls or other boundaries where particular conditions apply. The subroutine is divided into chapters, each handling a particular variable and being called from a CALC subroutine, and each chapter considers all the boundaries around the solution domain.
LISOLV	Updates entire field of a particular variable, by applying TDMA (<u>t</u> ri <u>d</u> iagonal <u>m</u> atrix <u>a</u> lgorithm) to all the lines in the r-direction sequentially from left to right of the integration domain.

program to which a user will devote most of his attention, provided that he wishes to investigate configurations easily derivable from that shown in Fig. 5. He may also be concerned with PROMOD to adjust boundary condition types. Moreover all the subprograms are divided into chapters, each with a prescribed task to accomplish, thus decreasing the possibility of error on problem specification and modification.

MAIN controls the entire iterative solution procedure, with initial calls to INIT (initialization), PROPS (properties) and PRINT (for output of all variable fields). Repeated intermediate calls occur during the iteration loop to the CALC subroutines (CALCU for updating calculation of the U-velocity field, etc.), PROPS and PRINT (when required). Finally, after convergence or MAXIT (maximum iterations) number of iterations, PRINT is called again, together with the calculation and output of any special quantities required which are deducible from the flowfield values. Each of the CALC subroutines calls PROMOD (problem modifications) for modifications to the usual formulation because of boundary conditions. Subroutine LISOLV (line solve) is also called by each CALC subroutine to make several update sweeps of the relevant field of variables by applying the TDMA (tridiagonal matrix algorithm) to all the lines in the r-direction sequentially from left to right of the integration domain (NSWPU times for the u-field, etc. - number of sweeps for u).

Major variables. The discussion of Fortran variables is restricted to those symbols enjoying major significance in the accompanying listing of the program in Appendix E. Other symbols will readily yield their meanings on inspection of the context and their memonics; or they appear in parts of the program which the user is enjoined not to disarrange, the user restricting most of his attention to MAIN and PROMOD. A glossary of Fortran symbols is given in Appendix D. Table 5 lists principal dependent variables and controlling parameters.

Table 5. Principal Dependent Variables and Controlling Parameters

Algebraic Variable	Fortran Variable	Alphanumeric Heading	Logical Variable	Inlet Value	CALC Subroutine	Underrelax- ation factor	Number of sweeps of LISOLV per iteration	Prandtl/Schmidt Number	Residual Source Term
u	U	HEDU	INCALU	UIN	CALCU	URFU	NSWPU	-	RESORU
v	V	HEDV	INCALV	VIN	CALCV	URFV	NSWPV	-	RESORV
w	W	HEDW	INCALW	WIN	CALCW	URFW	NSWPW	PRW	RESORW
k	TE	HEDK	INCALK	TEIN	CALCTE	URFK	NSWPK	PRTE	RESORK
ϵ	ED	HEDD	INCALD	EDIN	CALCED	URFE	NSWPD	PRED	RESORE
p'	PP	HEDP	INCALP	-	CALCP	URFP	NSWPP	-	(RESORM for mass calculated in CALCP)
μ	VIS	HEDVIS	INPRO	-	PROPS	URFVIS	-	-	-

3.2 The MAIN Subprogram

General arrangement. MAIN is that section of the program to which a user will devote most of his attention. The function of MAIN has been described in section 3.1. It is divided into chapters, each with a specific task, and a description of the individual chapters of MAIN now follows.

C0 Preliminaries. Dimension, common and data blocks are followed by user input logical variables, which activate (when specified as true) certain special features of the program. As discussed in detail in Chapter 4, IFINE specifies a fine mesh in the x-direction with NI=35 as opposed to a coarser mesh with NI=23; IWRITE writes all dependent variables onto allocated disk storage; NONDIM calculates and prints the nondimensional solution in addition to the dimensional one; IREAD reads from allocated disk storage the initial solution guess, which is a previous solution of a similar problem; INITAL prints the initial guess of the solution; and INPLOT produces a line-printer plot of streamlines. Specification of NSWPU (number of sweeps for U), etc. and input read statements for alphanumeric headings HEDU (heading for U velocity), etc. are also located here. These alphanumeric headings are the only input data which appear after the program and are listed here in order:

U VELOCITY
V VELOCITY
W VELOCITY
PRESSURE
TEMPERATURE
TURBULENCE ENERGY
TURBULENCE DISSIPATION
VISCOSITY

DIMENSIONLESS LENGTH SCALE
DIMENSIONLESS STREAM FUNCTION
RADIAL COORDINATE OF STREAMLINES
DIMENSIONLESS U VELOCITY
DIMENSIONLESS V VELOCITY
DIMENSIONLESS W VELOCITY
DIMENSIONLESS PRESSURE
DIMENSIONLESS TURBULENCE ENERGY
DIMENSIONLESS STREAMLINE COORDS
DIMENSIONLESS EFF. VISCOSITY

C1 Parameters and control indices. This chapter really defines the problem to be solved. It is implicit that the problem is axisymmetric in cylindrical coordinates with the setting of INDCOS = 2. The problem domain is specified by dealing with the grid exemplified in Fig. 5, and giving values to the key parameters there-in. Other matters include dependent variable selection (setting .TRUE. or .FALSE. to INCALU etc.), fluid properties (see Prandtl/Schmidt numbers of Table 4), turbulence constants, boundary values (see inlet values of Table 4), pressure calculation reference point (IPREF, JPREF) and program control and monitor.

C2 Initial operations. Based on the problem specification already accomplished in C0 and C1, certain other initial operations are needed prior to the iteration procedure. In C2 the geometric quantities for the grids (see Figs. 9-11) are calculated and main 2-D array variables are set to zero or obvious initial values by way of the call to subroutine INIT. Returning to MAIN, the dependent variable fields are first specified at the inlet boundary including swirl velocity which uses VANB or SWNB for flat or solid-body rotation profile according to whether NSBR (number for solid body rotation) equals 0 or 1. Then estimates of dependent variables in the

field are calculated, as many of them depend on inlet values. Following the call to PROPS for fluid properties, an initial output is made of certain flow and geometric quantities. Finally, if IREAD = .TRUE. each dependent variable array is read sequentially from the disk storage allocated to unit 12 to re-specify the initial field estimates with improved values. Thus the user should specify IREAD = .TRUE. when a previous solution to a similar problem is available on disk, as this reduces the number of iterations required for convergence.

C3 Iteration loop. This is the section of MAIN that is repeated at each iteration where NITER counts the number of iterations. The task of C3 is several-fold: to adjust the underrelaxation factors for enhanced convergence based on numerical experience; to update dependent variables (via calls to subroutine CALCU if INCALU is true, etc.); to update fluid properties (if INPRO is true the call to PROPS updates secondary dependent variables); to give intermediate output of residual source sums and field values at monitored location (IMON, JMON) for all values of NITER; to include appropriate field prints when NITER=JPRINT; and finally to make appropriate iteration termination tests.

C4 Final operations and output. Having decided to terminate the iteration process, control transfers to C4 to obtain final variable field print-outs and to calculate and print nondimensional variables if NONDIM = .TRUE. Also, a call to subroutine STRMFN calculates dimensionless stream function and determines the coordinates of points along NSTLN streamlines for plotting. Further, if IWRITE = .TRUE. each dependent variable array is stored sequentially on the disk space allocated to unit 11.

Control has now finished with the current problem. However, if LFS (loop for swirl) is less than LFSMAX (loop for swirl maximum) then LFS is incremented by 1, and the inlet swirl velocity profile is recalculated

for the next swirl problem based on SWNB (swirl number block) or VANB (vane angle block) according to whether NSBR (number for solid body rotation) equals 0 or 1. Before control begins C3 for the new swirl problem, the previous solution of a similar problem will be read from disk storage allocated to unit 12 if IREAD = .TRUE. This improved initial field estimate reduces the number of iterations required for convergence.

3.3 Subroutine INIT

INIT consists of two main chapters:

C1 Calculate geometric coefficients. Geometric quantities for the three grids for C, U and V cell control volumes (see Figs. 3 and 9-11) are here calculated once and for all for the particular geometric system previously specified in MAIN. Notice that setting INDCOS = 1 suppresses the variation of R with Y and thus obtains cartesian coordinates. In the current program, however, the problem is correctly coded only for cylindrical coordinates.

C2 Set variables to zero. In C2 most dependent and other 2-D array variables are set to zero throughout the flowfield although some are set to obvious nonzero initial values.

3.4 Subroutine PROPS

There is only one chapter:

C1 Viscosity. The turbulent viscosity μ is calculated from the two-equation k- ϵ turbulence model, Eqs. (5) and (6), making use of the URFVIS underrelaxation parameter.

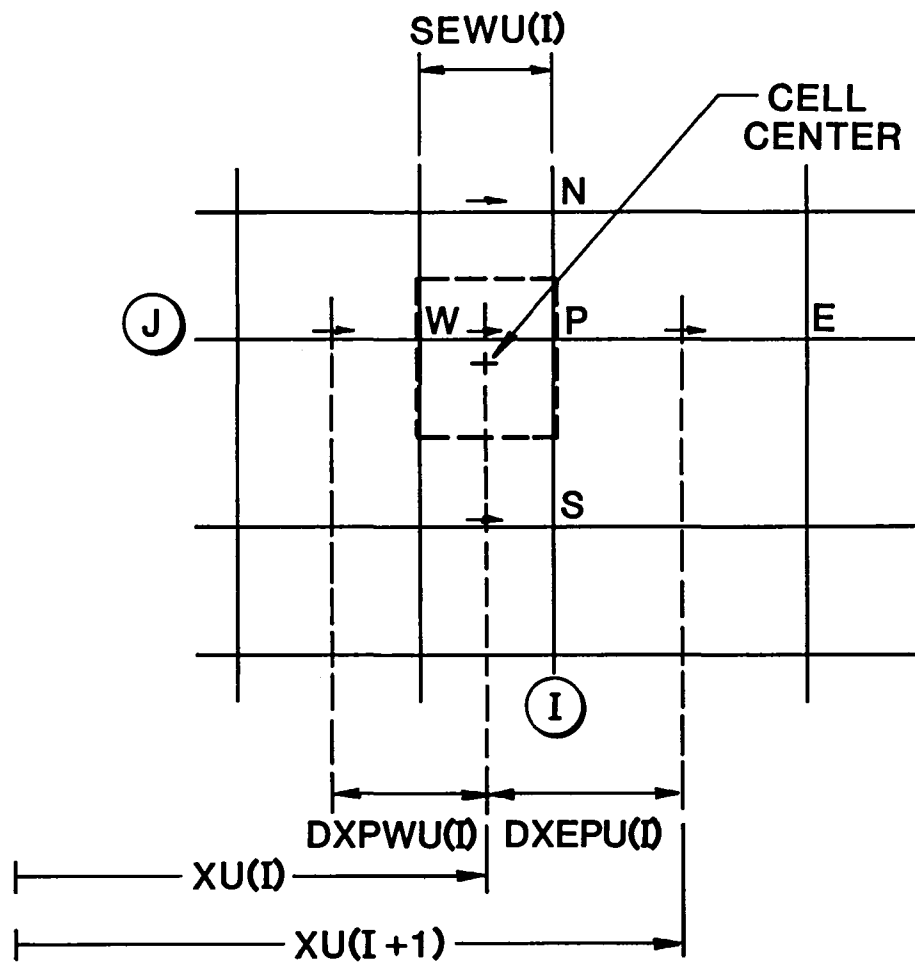


Fig. 10. Fortran variables related to the grid for U cells.

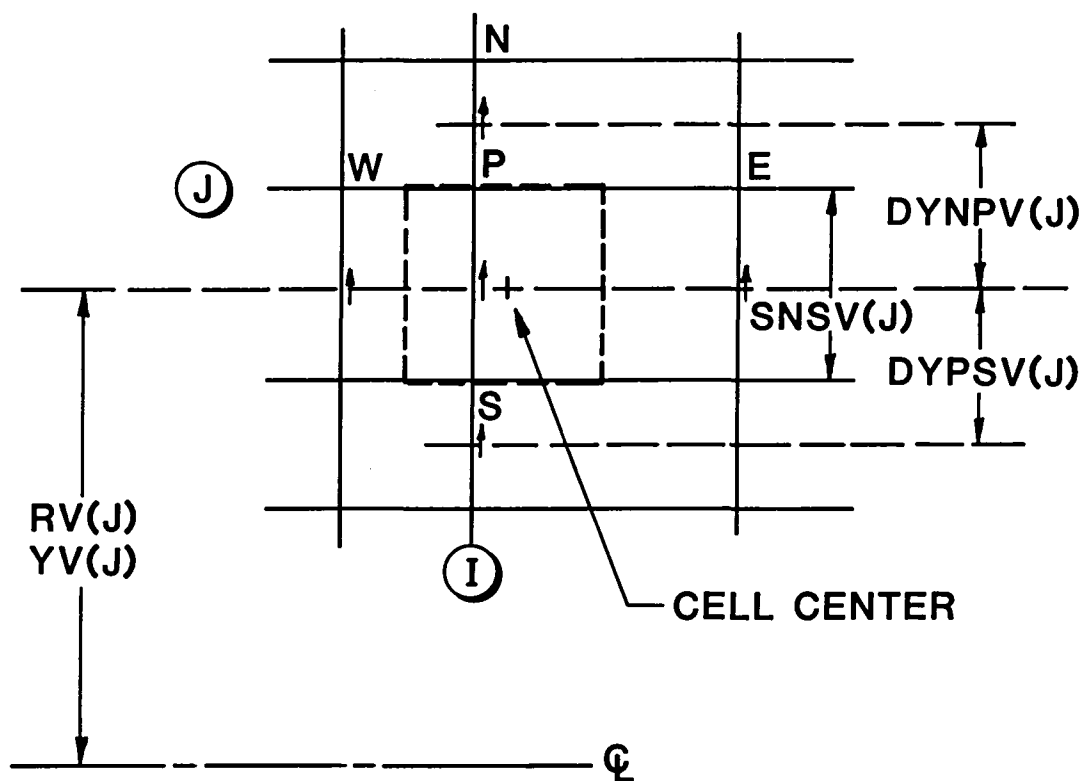


Fig. 11. Fortran variables related to the grid for V cells.

3.5 Subroutines CALCU and CALCV

CALCU has the task of calculating the appropriate coupling coefficients linking the value of U^* at each 'w' point of the mesh system with its four neighbors via Eq. (11). The formulation is completely general and correct only for internal points but the call to PROMOD (2)(problem modifications, chapter 2) corrects for near boundary points by applying the correct formulation via a linearized source technique (see section 2.3). Underrelaxation via Eq. (43) precedes the updating of the U^* field via a call to LISOLV, this being called NSWPU (number of sweeps for U) times for multiple inner updates of the U^* field. The task of CALCV is similar as it renews the V^* field and utilizes PROMOD (3). The chapters are:

C1 Assembly of coefficients. Two nested loops for I and J ensure that all internal points of the mesh are considered in C1. For each (I, J) - point the following sequence of calculations is performed:

- (i) the cell face areas and volume (utilizing the geometric variables of Figs. 9-11.
- (ii) the convection coefficients via the mass-velocities GN etc. and mass flow fluxes through the faces CN etc.
- (iii) the diffusion coefficients utilizing viscosities, areas and distances to obtain DN etc.
- (iv) the coefficients of source terms - here only the 'false' source stabilizing trick components of Eq. (9) are used; other parts of the source term are added in later.
- (v) the main coefficients AN etc. are assembled, using the 'hybrid' formulation of central and upwind differences, Eq. (10). The SU and SP components of the source expression are now determined with the pressure term going into SU, see Tables 1 and 2.

C2 Problem modifications. The general formulation of C1 is modified for near boundary points via the call to PROMOD. The call is to Chapter 2 of PROMOD in the case of CALCU and to Chapter 3 in the case of CALCV.

C3 Final coefficient assembly and residual source calculation. Two nested loops for I and J allow all points of the grid to be dealt with in turn. Firstly, $AP (= a_p)$ is calculated and RESORU (residual source for U) is incremented, and secondly, the underrelaxation demands of Eq. (43) are applied.

C4 Solution of difference equation. LISOLV is called NSWPU times in order to update the U^* field several times (NSWPV times in the case of V^*). The LISOLV parameter list begins 3, 2, ... in the case of CALCU, but 2, 3, ... in the case of CALCV. Careful observation of the relationship between the physical and reference storage locations of the displaced grid systems for U and V confirm this requirement.

3.6 Subroutine CALCP

CALCP deals with the variable PP (= p' the pressure correction) in a similar fashion to the CALCU and CALCV subroutines just described. However, there are several points of difference:

- (i) the subroutine is concerned with Eq. (15) and the calculation of p' ,
- (ii) the assembly of coefficients is simpler than the previous two subroutines,
- (iii) the subroutine closes with the application of the p' field to correct the latest estimates so far of the u , v and p fields, that is u^* , v^* and p^* , by appropriate use of Eqs. (12) through (14).

C1 Assembly of coefficients. Two nested loops sweep through the entire grid system. At each point the following sequence of calculations is performed: areas and volume of cells, coupling coefficients, source terms and absolute mass sources.

C2 Problem modification. A call statement to PROMOD (4) is included.

C3 Final coefficient assembly. Coefficient AP is calculated for all points of the mesh.

C4 Solution of difference equations. LISOLV is called NSWPP times in order to obtain a good estimate of the p' field. The parameter list, beginning 2, 2, ..., is appropriate since pressures are stored at grid intersections.

C5 Correct velocities and pressure. When this stage is reached, first estimates of the u , v and p fields (U^* from CALCU, V^* from CALCV and p^* from previous iteration) are known. Equations (12) through (14) are applied to obtain better estimates and ensure that the U^* and V^* momentum equation first-estimate solutions are brought into conformity with the continuity equation. Notice that the DO loop ranges are a little complicated so as to operate only on internal field points. There is no underrelaxation here on the velocity components (this was done prior to obtaining the U^* and V^* fields). Also, the required p' correction is added to the latest estimate of the pressure field p^* .

3.7 The other CALC subroutines

The other main dependent variables which are to be solved from their governing partial differential equations are w , k , and ϵ as seen in Table 1. Each of these is dealt with in a separate subroutine denoted by the name CALC followed by W, TE and ED. They are each called sequentially in this order directly from the MAIN subprogram; and each of them is structured

similarly to the CALCU and CALCV subroutines described in section 3.5. Only highlights of the differences need be described.

C1 Assembly of coefficients. Since all these variables are physically located at the grid intersections, both the I and J loops begin with the value 2 and ensure a sweep over all internal mesh points. The third part of C1 is concerned with diffusion coefficients and it is here that the Prandtl/Schmidt numbers PRTE, etc. in Table 4 are brought into play: viscosities are divided by PRTE, etc. in order to obtain the appropriate exchange coefficients. The fourth part concerns source terms and rather longer expressions are formulated as required from Table 1.

C2, C3 and C4. These bear such a strong resemblance to their corresponding chapters already described in section 3.5 that no further elaboration need be given here, except to remark that the LISOLV call always begins with the parameters 2, 2.

3.8 Subroutine LISOLV

LISOLV (line solver) is called from each of the CALC subroutines. When called it provides one complete sweep of the relevant interior points at which the variable is located. Also it replaces the 2-D array PHI, the last parameter of the call list, with the solution of the equations previously built-up in the calling subroutine. This is effected by means of the well-known TDMA (tridiagonal matrix algorithm) being applied to each vertical gridline in turn, and traversing along all such lines in the vertical direction sequentially from left to right of the integration domain.

The subroutine begins with a DO loop for the W-E sweep. There is some complexity here involving ISTART and JSTART, the first two parameters of the call list (these are usually given the values 2, 2 but are 3, 2 and 2, 3 when the call is from CALCU and CALCV respectively). But careful perusal of

the steps involved will assure the reader that the calculations are correct. The subsequent parts of the subroutine concern implementation of the TDMA technique: with the S-N traverse, assembling the TDMA coefficients, the calculation of the coefficients of the recurrence formula and the back-substitution to obtain the solution values of the S-N gridline.

3.9 Subroutine PRINT

The task of PRINT is to print out the values of a 2-D array PHI, together with associated heading HEAD, the last parameter of the call list. The X and Y coordinates are written horizontally and vertically around the output matrix of values. Again, as discussed in Section 3.8, the first two parameters of the call list, ISTART and JSTART, are usually 1,1 so that all internal and external values are printed to help diagnostics. Also, for U the XU values are printed and for V the YV values so that correct physical position values accompany the output of these variables which are located on displaced grids.

3.10 Subroutine PROMOD

The finite difference equation coefficients are formulated in each of the CALC subroutines on the assumption that each point is a usual internal point. Of course some points lie near or on the rectangular boundary of the flow domain in which the solution is sought and the general formulation of a CALC routine is not correct at these points. So that all required corrections to the general formulation are simple to understand and apply, each CALC routine calls a particular chapter of PROMOD (problem modifications). This subroutine has the task of modifying the values of the finite difference equation coefficients, or the variables, near walls or other boundaries where particular conditions apply. Each chapter concerns itself solely with one

particular variable and each chapter considers in turn each of the boundaries around the solution domain. Boundary conditions are thus easy to formulate and simple to apply; and this novel feature makes PROMOD second only to MAIN as a subroutine to which a prospective user needs to apply his attention.

According to the value given to NCHAP (number of chapter required) of the call list, control proceeds to one and only one of the eight chapters of this subroutine. These chapters deal with:

- C1 Properties
- C2 U momentum
- C3 V momentum
- C4 Pressure correction
- C5 Thermal Energy
- C6 Turbulent kinetic energy
- C7 Dissipation
- C8 W momentum

where C5 is retained from the original TEACH arrangement, but is not used in the present version of the code.

Figure 5 reveals that amongst the boundaries of the solution domain only at the inlet is the usual formulation of the finite difference equations, as computed in the CALC subroutines, correct. At other boundaries of the solution domain appropriate sections of PROMOD have to supply the correct influence of the boundary conditions on the coupling coefficients a_j^ϕ ($j = N, S, E, W$ and P) and components S_U^ϕ and S_P^ϕ of the linearized source term. In PROMOD each of the chapters is further divided into sections dealing with

- (i) Northern top wall, $I = 2$ to $NIM1$
- (ii) Southern symmetry axis, $I = 2$ to $NIM1$
- (iii) Western side wall, $J = 2$ to $NJM1$
- (iv) Eastern outlet, $J = 2$ to $NJM1$

In what follows all four cases of a N, S, E and W near-boundary point are dealt with simultaneously. One merely reads the appropriate line (designated by (N), (S), (E) and (W)) of the equations which follow, according to the particular case in which the reader is temporarily interested. Notation follows that of the boundary cells of Figs. 6 and 7.

Boundary conditions are inserted for each boundary cell. The first step generally involves breaking the link to any adjoining external cell by setting to zero the appropriate a_j of Eq. (11). Then, for each boundary

$$\begin{aligned}
 a_N(I, J) &= 0 & (N) \\
 a_S(I, J) &= 0 & (S) \\
 a_E(I, J) &= 0 & (E) \\
 a_W(I, J) &= 0 & (W)
 \end{aligned}
 \tag{45}$$

This step is followed by insertion of the correct boundary flux (diffusion and/or convection) for the cell boundary in question into the linearized source terms SU and SP, as exemplified in the following sections.

Neumann conditions. If zero normal gradient condition is the one to be applied, breaking the appropriate link is all that is required. For then the terms

$$\begin{aligned}
 a_N(\phi_P - \phi_N) &= 0 & (N) \\
 a_S(\phi_P - \phi_S) &= 0 & (S) \\
 a_E(\phi_P - \phi_E) &= 0 & (E) \\
 a_W(\phi_P - \phi_W) &= 0 & (W)
 \end{aligned}
 \tag{46}$$

are all zero in Eq. (11) so there is no flux through the boundary in question.

Dirichlet conditions. If the value of ϕ is prescribed as ϕ_B on the boundary then the usual boundary link is broken via Eq. (16). For a solid boundary the convective flux through the boundary face of the cell is zero,

but the diffusive flux is typically nonzero. Hence the diffusion term of Eq. (8) is transferred to the right-hand side RHS of the equation where it is incorporated into SU(I,J) and SP(I,J); on the RHS it is expressed in terms of ϕ_P and ϕ_B as

$$\begin{aligned}
 \Gamma_B (\phi_B - \phi_P) r_B \Delta x / \delta y & \quad (N) \\
 \Gamma_B (\phi_B - \phi_P) r_B \Delta x / \delta y & \quad (S) \\
 \Gamma_B (\phi_B - \phi_P) r_B \Delta y / \delta x & \quad (E) \\
 \Gamma_B (\phi_B - \phi_P) r_B \Delta y / \delta x & \quad (W)
 \end{aligned} \tag{47}$$

where Γ_B is the appropriate exchange coefficient for ϕ evaluated at point B. Appropriate cell boundary face areas appear here. North and south face areas are given by $r_B \Delta \theta \Delta x$ whereas east and west areas are expressed as $r_B \Delta \theta \Delta r$; but $\Delta \theta$ cancels from the governing equations. These expressions may be split between SU(I,J) and SP(I,J) as

$$SU(I,J) = SU(I,J) + \begin{cases} \Gamma_B r_B \phi_B \Delta x / \delta y & (N) \\ \Gamma_B r_B \phi_B \Delta x / \delta y & (S) \\ \Gamma_B r_B \phi_B \Delta y / \delta x & (E) \\ \Gamma_B r_B \phi_B \Delta y / \delta x & (W) \end{cases} \tag{48}$$

and

$$SP(I,J) = SP(I,J) - \begin{cases} \Gamma_B r_B \Delta x / \delta y & (N) \\ \Gamma_B r_B \Delta x / \delta y & (S) \\ \Gamma_B r_B \Delta y / \delta x & (E) \\ \Gamma_B r_B \Delta y / \delta x & (W) \end{cases} \tag{49}$$

Flux specified. If the flux of ϕ through a boundary face of the cell is specified. When brought to the RHS of Eq. (8) it may be approximately expressed as $b\phi_p + c$ where b and c are known (if possible, retaining $(-b)$ and (c) both positive to aid the convergence of the finite difference iteration procedure). This is implemented by breaking the boundary link and augmenting the source terms appropriately:

$$SU(I,J) = SU(I,J) + c \quad (N,S,E, \text{ and } W) \quad (50)$$

$$SP(I,J) = SP(I,J) + b \quad (N,S,E, \text{ and } W) \quad (51)$$

Fixing a value at an internal point. The value of ϕ at a near-boundary point P may be fixed at a value of ϕ_F via setting

$$SU(I,J) = \phi_F 10^{30} \quad (N,S,E, \text{ and } W) \quad (52)$$

$$SP(I,J) = -10^{30} \quad (N,S,E, \text{ and } W) \quad (53)$$

so that these terms dominate in the equation for ϕ at P , with the solution $\phi_P = \phi_F$.

Convective and diffusive influences. If both convection and diffusion through a cell boundary occurs, the hybrid formulation should be used. In this situation the contribution C for the flux passing the surface in question (N,S,E , or W) is calculated according to Eq. (10) and used along with the other surface contributions and source terms to formulate the usual finite difference equation. This is ensured automatically in the program for a normal inflow/outflow boundary.

3.11 Subroutine STRMFN

Subroutine STRMFN has been developed to calculate the dimensionless stream function

$$STFN = \int_0^r ur dr / \int_0^{d/2} ur dr \quad (54)$$

for all internal field points of the u-cell grid. The quadrature formulation for calculating STF_N is essentially the Trapezoidal Rule. The integration proceeds radially one step SNSV(J) at a time so that a finite difference mesh which is either uniform or nonuniform in the radial direction is permissible.

The coordinates of points constituting each of NSTLN streamlines with dimensionless stream function values STVAL ranging from 0.0 to 1.0 are subsequently calculated for plotting. The present code calculates the coordinates of eleven streamlines with $\psi^* = 0.0, 0.1, \dots, 1.0$. Each streamline is represented by NI-1 points whose dimensionless x- and r-coordinates are stored as XUND(I) and YSTLND(I,K) (K = 1,...,11) respectively, where the k-index indicates the particular streamline. These two arrays are employed in producing COMPLIT streamline plots via the usual CALCOMP subroutines. Immediate line printer plots of alternate streamlines are obtained through the use of corresponding arrays XUDPLT(I) and YSLPLT(N,I) (N = 1,...,6) for the six streamlines $\psi^* = 0.0, 0.2, \dots, 1.0$.

3.12 Subroutine PLOT

The PLOT subroutine is a variant of the ϕ - profile line printer plot routine supplied with some versions of the GENMIX computer program. It is now described at length in a recent text.³⁴ In the present version supplied, it is called twice after each converged solution has been obtained. Firstly, with the parameter LARGE equal to 0 (giving a small-sized plot) and secondly with LARGE equal to 1 (giving a larger-sized plot). Prominent in the call list are XUDPLT(I) and YSLPLT(N,I) (N = 1,...,6) as described in Section 3.11 from which the required six streamlines are plotted. A 50 x 100 array is filled with alphanumeric characters as appropriate so as to give labels

0,2,4,6,8 and 1 corresponding to the nondimensional streamlines $\psi^* = 0.0, 0.2, \dots, 1.0$.

4. USER'S GUIDE

4.1 Problem Specification

General. The listing of the program, which is supplied in Appendix E, is used for precisely those calculations which have been described in Sections 2 and 3 of this report. The user of the program will wish to make other calculations; for this he must modify the program. Although the description of the program which was given in Section 3 will allow the discerning reader already to distinguish the parts of the program which must be altered, the following notes will aid him to make the modifications to suit his case, without going through the whole program.

The general principles which the user should adopt are:

- (i) Read through MAIN, paying special attention to the Chapter titles, and other subtitles, and considering whether any of the features of the problem which relate to those titles have suffered changes which should be incorporated.
- (ii) Make the corresponding changes to MAIN.
- (iii) If modifications are desired to the turbulence model, introduce these in C2 of MAIN and/or C2 of PROPS.
- (iv) If different wall boundary conditions are required, read carefully Sections 2.3 and 3.10 and then change PROMOD accordingly.
- (v) Check that the COMMON statements are still adequate.
- (vi) Leave the general parts of the program alone, including the CALC subroutines, INIT, PROPS, LISOLV and PRINT (except those minor nonstructural parts just mentioned).

The following discussion is organized under the headings: Input data specification, system specification, boundary conditions, and turbulence specification.

Input data specification. Much of the data is internally specified. However, if IREAD = .TRUE. has been declared in C0 of MAIN, the unformatted reading of all input data from disk storage is activated. This input requires the proper job control "card" to allocate the logical unit number of the READ statement to the disk storage data file from which the data is to be read. The dependent variable fields are read from disk storage as an improved (near-solution) initial estimate to reduce the number of iterations required for convergence.

As seen in Section 4.2, the X(I) and Y(J) [=R(J)] arrays precede the dependent variable arrays sequentially written on each data file stored. Hence in C0 of MAIN, these two independent variable arrays are read to enable the next unformatted READ in C2 of MAIN to read the U(I,J), etc. dependent variables. After the solution is printed in C4 of MAIN, the dependent variable arrays are re-initialized for the next swirl loop by another series of unformatted reads from disk storage. Also, as discussed in Section 3, alphanumeric headings are read in C0 of MAIN using an A format field.

System specification. Minor variants of the sample grid system of Fig. 4 can be derived simply by appropriate modifications being made to the grid section of C1 of MAIN. Appropriate choice of the integers NI, NJ, ISTEP, JSTEP and JMAX(I) together with RLARGE (=D/2) ALTOT (= total length), EPSX (the gradual expansion rate in the axial direction) and Y(J) defines completely the axisymmetric geometry with INDCOS = 2. Assigning true or false to INCALU etc. activates the calls to subroutine CALCU etc. during the subsequent iteration cycle to update the U-velocity field. They also determine whether printing is required. Clearly, true settings will generally be the ones to use for all the dependent variables. Specification is also required for

fluid properties, including Prandtl/Schmidt numbers and all material constants in SI units.

Boundary conditions. C1 of MAIN specifies boundary values of all the dependent variables. Hence specification of UIN etc. are required for the main inlet. Most inlet profiles of the turbulent flow are then taken to be uniform in C2 of MAIN and the user can easily amend this if desired. Employed here is the swirl number block SWNB or vane angle block VANB according to the value of NSBR (number for solid body rotation). The specification NSBR = 1 activates SWNB, which gives solid body rotation from a swirl generator, and NSBR = 0 activates VANB for a flat swirl velocity profile from swirl vanes. In either case, the desired inlet values of swirl velocity W are assigned appropriately.

Initial field values of all the dependent variables are specified in C2 of INIT and C2 of MAIN. The user will be content to leave these alone, for as soon as the iteration process is underway, these estimates are improved. Only occasionally in some cases will they be too inaccurate to permit a smooth iterative process to continue from their values - in such cases more realistic values closer to the true solution and/or underrelaxation must be specified.

Turbulence specification. Minor adjustments to the turbulence model already in the program can be simply achieved by altering the turbulence constants part of C1 of MAIN and C2 of PROPS for the viscosity calculation. If one desired to make a computation for laminar flow, VIS must be filled with appropriate values in the DO 100 loop of PROPS. Also, the logical variables INCALK and INCALD could be specified as false to suppress the calculation of k and ϵ and the complexity in PROMOD for velocities near wall boundaries would be removed. When a different turbulence model is required, of course, C2 of PROPS must reflect this. Should a nonisotropic

or direct turbulent stress specification model be required, more far-reaching changes would be required to the diffusion term calculations in all the CALC subroutines, possibly with other CALC routines for solving stress equations. It is here that current knowledge is uncertain and much current research activity is being directed toward more realistic turbulence models.

4.2 Iteration and Accuracy

Iteration control. The iteration process is monitored by comparing the sum of the absolute values of residual source of mass in the field, RESORM, with a preset value, SORMAX, representing maximum source. Similarly for other variables U, V, W, etc. iteration is terminated for a particular problem when the largest residual source is less than SORMAX, or number of iterations NITER is greater than the maximum number of iterations MAXIT to be allowed. By analogy a divergence criterion can also be included if required, so as to prematurely terminate a computation giving results which appear not to be converging.

Fortran variables which are used to influence the iteration behavior are NSWPU etc. (representing number of update sweeps for U etc.) and URFU etc, (representing underrelaxation for U etc.). If divergence is found, the remedy often lies in increasing the former (especially NSWPP for pressure) and reducing the latter. However, the accompanying listing includes reasonable values which have been found convenient to use. They are automatically re-assigned in the iteration process according to the inlet swirl strength and number of iterations made toward convergence, as inspection of the listing reveals.

Output. At every iteration, RESORM etc. are printed out along with monitored values of variables at the location specified by IMON and JMON. Full field prints presently after 100 iterations and increments of 50 thereafter. Full field prints are obtained for each dependent variable with a true logical variable (like INCALU for U-velocity) by way of a call to subroutine PRINT. The user, of course, is entirely free to make any output he wishes at each iteration stage in C3 of MAIN and to make a field print of any 2-D array via a call to PRINT. This structure is a flexible one which can be utilized to advantage.

If IWRITE = .TRUE. has been specified in C0 of MAIN, the unformatted writing of all output data onto disk storage is activated. This output requires the proper job control "card" to allocate the logical unit number of the WRITE statement to the disk storage data file which is to receive the data. First, the X(I) and then the Y(J) [=R(J)] arrays are written to disk storage allocated to logical unit 11, as seen in the initial output portion of MAIN, C2. Also, located here is the writing of XUND(I), nondimensional XU(I), to disk storage allocated to logical unit 14.

Upon completion of the solution process for each swirl loop each field variable is nondimensionalized and printed (if NONDIM = .TRUE.) subsequent to the printing of dimensional variables. Then, the following dependent variable arrays are written onto disk (logical unit 11): U(I,J), V(I,J), W(I,J), P(I,J), TE(I,J), ED(I,J), VIS(I,J) and STFNI(I,J). Immediately following is the WRITE of YSTLND(I,K) to disk (logical unit 14), where YSTLND(I,K) contains the dimensionless radial coordinate corresponding to each dimensionless axial coordinate XUND(I) along each K streamline. These arrays are subsequently used in obtaining CALCOMP streamline plots.

Independence of grid size. A computation may be considered to be accurate if alterations in the grid size produce no significant changes in the values of dependent variables, or the fluxes, at the points in the flow or its boundary which are interesting to the user of the program. Such alterations are obtained by changing the values of NI and NJ (number of grid intervals in I and J (i.e. X and Y) directions) along with EPSX and Y(J). Specification of these quantities is made in C1 of MAIN. Of course, large values of NI and NJ increase the computer time significantly, so smallest values should be used that are consistent with acceptable accuracy. There is no way but trial to establish what these values are, but a 23 x 21 or 35 x 21 grid is probably sufficient, as available by simple choice in the delivered code.

Comparison with exact or experimental values. Further tests of accuracy can be made by setting the geometry and boundary conditions of the program to correspond to a problem for which exact solutions or experimental results are available. For example, the inlet step could be dispensed with and standard pipe flow results. In either case the presence of swirl and turbulence is optional. Hence comparison of the predictions of the program for this degenerate case with exact or experimental results can provide valuable insight into the accuracy with which the differential equations are being solved.

'Trouble-shooting' - It is possible to mention only a few of the remedies which can be employed when the program, in the course of being adapted to a new problem, generates computations that are evidently faulty.

To prevent divergence, the source terms should be formulated so that -SP is always positive for each ϕ variable. This keeps the point P dominant in its finite difference form with its N, S, E and W neighbors and aids the

stability of the iteration process. The forms shown in Table 2 enjoy this characteristic.

Lack of conservation of properties which ought to be conserved is often the result of incompatible specification of boundary conditions and fluid properties, for example. One has to take extreme care. It is not possible to say much more in general than that inadvertently introduced incompatibilities are among the most common causes of error.

4.3 The Sample Computation

The sample computation code listing (Appendix E) and the results given in the microfiche supplement are concerned with the inert turbulent flow in an idealized combustion chamber. An air flow (constant density $\rho = 1.211 \text{ kg/m}^3$ and molecular viscosity $\mu = 1.8 \times 10^{-5} \text{ kg/ms}$) enters a 45 deg. expansion ($\alpha = 45 \text{ deg.}$) from an inlet pipe (radius $d/2 = 0.03125 \text{ m}$) to a large pipe (radius $D/2 = 0.0625 \text{ m}$). The total length of the flow domain is 0.5 m so as to be sufficient to enclose any expected recirculation zones. Computer runs through a range of seven inlet swirl vane angles $\phi (= \arctan w_{in}/u_{in})$ equal to 0, 45, 55, 60, 65, 68 and 70 deg. are given, although serious production runs with the larger swirl strengths are made with the total length further extended to about 0.8 m in order to cover a larger domain associated with a longer central recirculation zone. A maximum of 200 iterations for each swirl strength is allowed, with the solutions for each value of ϕ being used as the initial starting values for the next higher value of ϕ .

The flow domain is covered by a 23 x 21 mesh system ($NI = 23$ for the x-direction, $NJ = 21$ for the r-direction). The sidewall angle of $\alpha = 45 \text{ deg.}$ is accommodated by way of four steps each of three cells high in the radial direction. The specification is


```

ISTEP = 2
JSTEP = 8
JMAX(1) = 8
JMAX(2) = 11
JMAX(3) = 14
JMAX(4) = 17
JMAX(I) = 20 (I = 5,6,...,21)

```

In the x-direction a uniformly expanding grid up to $x = 0.375$ m at $I = 20$ is specified via $EPSX = 1.11$, then equidistant addition grid lines are specified up to $x = 0.5$ m at $NI = 23$. This grid is appropriate for side-wall angles $\alpha = 45$ and 90 deg., though with $\alpha = 70$ deg. a uniformly expanding grid up to $x = 0.375$ m at $I = 30$ is specified via $EPSX = 1.102$, then equidistant additional grid lines are specified up to $x = 0.55$ m at $NI = 35$. In the r-direction the 21 grid lines are clustered near the expansion corner, centerline and north wall since additional refinement is required in regions with expected large gradients. The choice of x-grid is determined by setting IFINE to be true or false, giving fine or coarse grid system, respectively. Both grids are arranged

- (i) to give good resolution in strategic locations near the inlet, exit, projecting corners and front and back stagnation points,
- (ii) to give corresponding axial locations at which to compare predictions with present and previous measurements.

Finally, the choice of logical variables in Chapter 0 of MAIN is self-explanatory giving rather detailed output but not reading from or writing to any disk storage locations.

When the user wishes to compute a problem with a sidewall angle α different from 45 deg. [as in the listing supplied in Appendix E] he has

to specify the x and r [$\equiv y$] grid line locations and $JMAX(I)$ for each I . Many variants of the flow domain of Fig. 5 discussed in Section 2.3 can thus be investigated. Auxiliary computations lead to the required specification. For example, other values of α are obtained by modifying the x -grid spacing near the inlet, which depends on NI , $EPSX$ and $ALTOT$, and comparing it with the corresponding r -grid spacing near the expansion corner. That is, $XU(3) - XU(2)$ is compared with $YV(JSTEP+2) - YV(JSTEP+1)$ to get the aspect ratio by the expansion corner. When a multi-cell step is envisioned a greater range of YV values are considered. Corresponding values of α can be tabulated with various combinations of NI and $EPSX$, and the user can then judiciously choose an appropriate combination with $JMAX(I)$ values for his needs.

Another parameter frequently requiring different values is swirl strength. The program is set up via LFS and $LFSMAX$ to sequentially calculate through a range of seven swirl vane angles. These angles are specified in a $DATA$ statement for the array $VANB$ which is activated if $NSBR = 0$. If $NSBR = 1$ the swirl number for consecutive swirl numbers to be investigated is specified via a $DATA$ statement for the array $SWNB$.

5. CLOSURE

The STARPIC computer program has been developed to predict swirling recirculating inert turbulent flows in axisymmetric combustion chambers. The technique involves a staggered grid system for axial and radial velocities, a line relaxation procedure for efficient solution of the equations, a two-equation $k - \epsilon$ turbulence model, a staircase boundary representation of the expansion flow, and realistic accommodation of swirl effects. Predictions of this type allow some results to be obtained more cheaply, quickly, and correctly than currently possible by the almost exclusive use of experimental means. Further development and application is providing a valuable supplementary technique for designers of practical combustion equipment.

This report has dealt with the computational problem and shown how the mathematical basis and computational scheme may be translated into a computer program. A flow chart, Fortran 4 listing, notes about various subroutines and a user's guide are supplied as an aid to prospective users of the code.

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7. NOMENCLATURE

A	Cell face area, Eq. (8)
a	Coupling coefficient, Eq. (11)
C	Contribution to cell surface integral, Eq. (10)
C,U,V	Control cell volumes for ϕ , u, v, Fig. 3
D	Chamber diameter, Fig. 1
d	Nozzle diameter, Fig. 1
E	Constant in law of wall, Eq. (24)
f	Underrelaxation parameter, Eq. (42)
G	k - generation term, Eq. (4)
I,J	Mesh point, Fig. 2
k	Kinetic energy of turbulence, Eq. (1)
\dot{m}_{net}	Net outflow of mass from cell, Eq. (9)
Pe	Cell Peclet number = $\rho u \delta / \Gamma$, Eq. (10)
p	Time-mean pressure, Eq. (1)
R	Residual source, Eq. (44)
S	Source term (with subscript), Eq. (1)
S_p, S_u	Components of linearized source term, Eq. (8)
V	Magnitude of total velocity vector, Eq. (24)
$\underline{v} = (u,v,w)$	Time-mean velocity (in x,r, θ directions), Eq. (1)
x,r, θ	Axial, radial, circumferential polar co-ordinates, Eq. (1)
y	Distance normal to a wall, Eq. (25)
Γ	Turbulent exchange coefficient, Eq. (1)
α	Side-wall angle, Fig. 1
Γ	Exchange coefficient, Eq. (7)

δx	Axial distance between two neighboring mesh points, Fig. 4
ϵ	Turbulence energy dissipation rate, Eq. (1)
κ	Constant in log law, Eq. (24)
μ	Effective viscosity, Eq. (5)
ρ	Time-mean density, Eq. (1)
σ	Prandtl-Schmidt number, Eq. (6)
τ	Wall shear stress, Eq. (25)
ϕ	Swirl vane angle, Fig. 1 dependent variable, Eq. (1)
ψ	Stream function, Eq. (7)

Superscripts

old	Last iterate value, Eq. (9)
*	Preliminary u, v and p field based on estimated pressure field p^* , Eqs. (12)-(15)
'	Correction value to u^*, v^*, p^* to get u,v,p, Eqs. (12)-(15)

Subscripts

in	Inlet, Fig. 1
l	Laminar value, Eq. (5)
n,s,e,w	North, south, east, west faces of cell, Eq. (8)
P,N,S,E,W	Point, north, south, east, west neighbors, Fig. 2
t	Total, Eq. (25)

APPENDIX A DERIVATION OF THE HYBRID DIFFERENCING SCHEME

In the discussion of Section 2.2, it was remarked that a hybrid differencing scheme is used in representing the combined effects of convection and diffusion at cell boundaries. It possesses certain advantages over the well-known central and upstream differencing schemes, and it is convenient to provide here sufficient derivation, in the context of the present 2-D axisymmetric flow problem. The reasons and choices are aided by comparison of possible finite difference representations with the exact solution of a simplified 1-D convection and diffusion problem, whose solution values and flux calculations therefrom provides useful guidance.

Consider the transport across one face of a control volume, for example the western face of area A_w normal to the x-direction which lies midway between the gridpoints W and P distant δx apart, as shown earlier in Fig. 4. The contribution C_w of the convection and diffusion terms of Eq. (1) to the surface integral for the western face is

$$C_w = [\rho u \phi - \Gamma_\phi \frac{\partial \phi}{\partial x}]_w A_w \quad (A1)$$

and the task is to derive a finite difference expression to represent the right hand side realistically in terms of ϕ and Γ_ϕ values at W and P using appropriate differencing. The choice will be aided by comparison with the exact solution of

$$\rho u \phi - \Gamma_\phi \frac{\partial \phi}{\partial x} = 0 \quad (A2)$$

in the interval $W \leq x \leq P$, taken without loss of generality to be $0 \leq x \leq \delta x$, where $\Gamma_\phi = (\Gamma_\phi)_w = \text{constant}$ and ρ and u are presumed to be constant known values evaluated at $x = \delta x/2$. Solving this one-dimensional

Eq. (A2) subject to the two grid values

$$\begin{aligned} x &= 0 & \phi &= \phi_W \\ x &= \delta x & \phi &= \phi_P \end{aligned} \quad (A3)$$

yields the solution

$$\phi = \phi_W + (\phi_P - \phi_W) \left[\frac{e^{Pe \cdot x/\delta x} - 1}{e^{Pe} - 1} \right] \quad (A4)$$

where the cell Peclet number has been defined by

$$Pe = \rho u \delta x / \Gamma_\phi \quad (A5)$$

which is evaluated at $x = \delta x/2$, i.e. at the western face of the cell around P. The exact solution, Eq. (A4), is portrayed in Fig. 12 where inspection shows that the value of ϕ always lies within the extreme values of ϕ_W and ϕ_P . When Pe becomes very large and positive, because of axial velocity u being very large and from left to right in Fig. 3, the ϕ - x curve is nearly horizontal and nearly equal to ϕ_W at all points, with a steep rise to the value ϕ_P as x approaches δx (i.e. near P). Conversely when Pe is very large and negative, because of axial velocity u being very large and from right to left for example, the ϕ - x curve is nearly equal to ϕ_P at all points with the steep part near $x = 0$ (i.e. near W). When Pe is near to zero in value, the linear interpolation straight line is close to the exact solution.

The present task is to look at the net transfer of ϕ across the mid-plane at $x = \delta x/2$ and to deduce a satisfactory finite difference analogue of the differential equation Eq. (A2) in terms of ϕ_W and ϕ_P . The flux of ϕ across the mid-plane at $x = \delta x/2$ is

$$Q_{\delta x/2} = \left[\rho u \phi - \Gamma_\phi \frac{\partial \phi}{\partial x} \right]_{x = \delta x/2} \quad (A6)$$

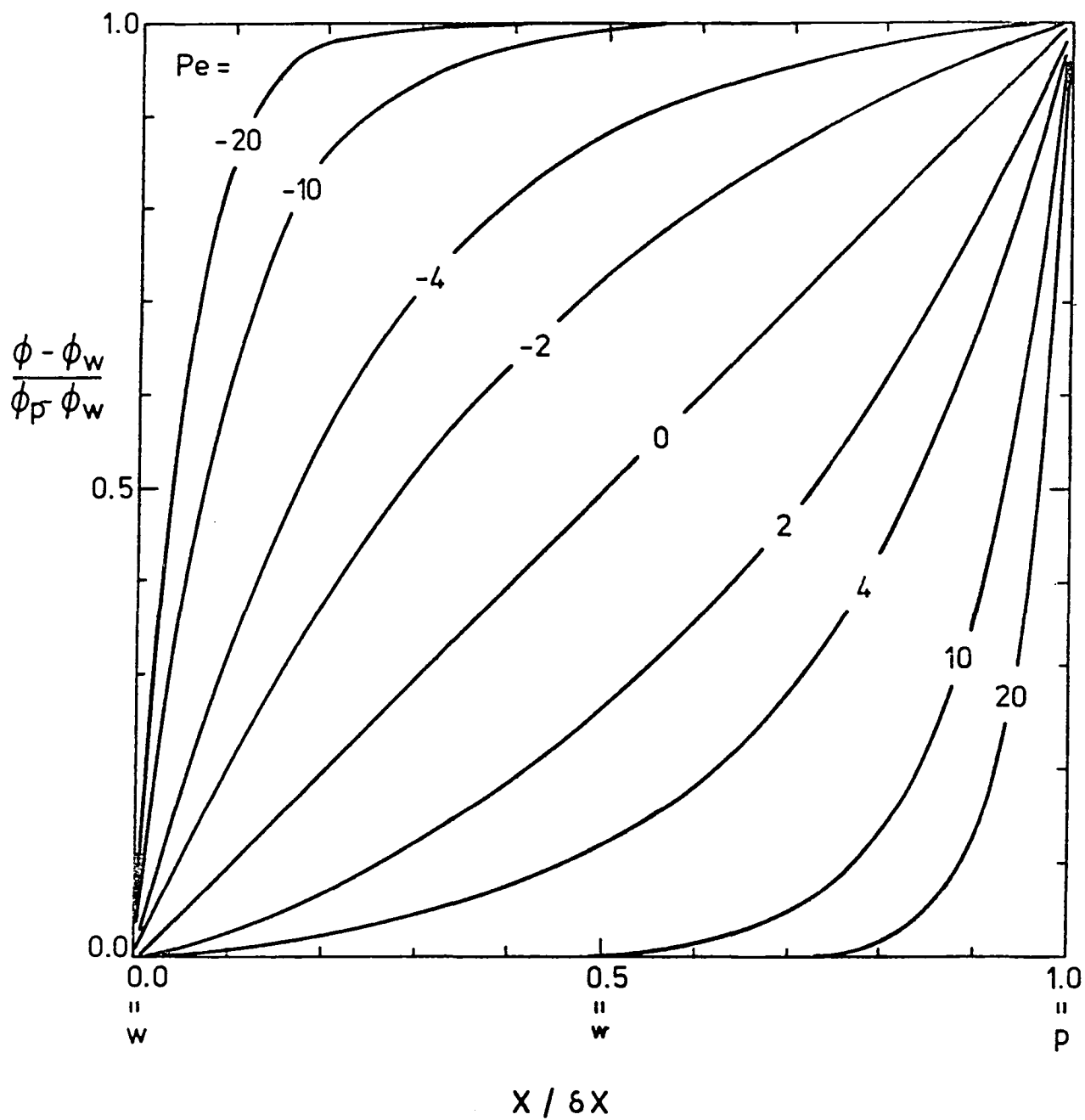


Fig. 12. ϕ versus x curves for different values of the cell Peclet number Pe (assuming $\phi_w < \phi_p$).

and upon substituting the exact solution for ϕ and $\frac{\partial \phi}{\partial x}$ at $x = \delta x/2$ using Eq. (A4) yields (see Appendix B)

$$\begin{aligned} Q_{\delta x/2} &= (\rho u)_{\delta x/2} \left\{ \frac{\phi_W e^{Pe} - \phi_P}{e^{Pe} - 1} \right\} \\ &= (\rho u)_{\delta x/2} \left\{ \frac{\phi_W e^{Pe}}{e^{Pe} - 1} - \frac{\phi_P e^{-Pe}}{1 - e^{-Pe}} \right\} \end{aligned} \quad (A7)$$

Three limits of this expression can be examined:

$$Pe \rightarrow +\infty \quad Q_{\delta x/2} \rightarrow (\rho u)_{\delta x/2} \cdot \phi_W \quad (A8)$$

$$Pe \rightarrow -\infty \quad Q_{\delta x/2} \rightarrow (\rho u)_{\delta x/2} \cdot \phi_P \quad (A9)$$

$$|Pe| \rightarrow 0 \quad Q_{\delta x/2} \rightarrow (\rho u)_{\delta x/2} \left\{ \phi_W \frac{1 + Pe + \dots}{Pe (1 + Pe/2 + \dots)} - \phi_P \frac{1 - Pe + \dots}{Pe (1 - Pe/2 + \dots)} \right\} \quad (A10)$$

$$= (\rho u)_{\delta x/2} (\phi_W + \phi_P)/2 - \Gamma_{\delta x/2} \frac{\phi_P - \phi_W}{\delta x} \quad (A11)$$

where terms of order Pe^2 and higher have been omitted from the last expression. Rearrangement and substitution of $\Gamma_{\phi, \delta x/2} / \delta x$ for $(\rho u)_{\delta x/2} / Pe$ has been made to obtain the final form of Eq. (A11). This last equation is equivalent to central differencing of the diffusion part (in square brackets) of Eq. (A1). The first two limits of Eqs. (A8) and (A9) are the upstream convection dominated limits where diffusion terms are negligible. In computing it is necessary to use a finite difference expression for the flux passing the surface for the western face contribution

$$C_W = Q_{\delta x/2} \cdot A_W \quad (A12)$$

which exhibits these three limiting cases. The hybrid scheme recommended and used in Refs. 17-23 exhibits these properties via the use of

$$C_w = \begin{cases} (\rho u)_w A_w (\phi_w + \phi_p) / 2 - (\Gamma_\phi)_w A_w (\phi_p - \phi_w) / \delta x & \text{for } |Pe| < 2 \\ (\rho u)_w A_w \phi_w & \text{for } Pe \geq 2 \\ (\rho u)_w A_w \phi_p & \text{for } Pe \leq -2 \end{cases} \quad (A13)$$

where $Pe = (\rho u)_w \delta x / (\Gamma_\phi)_w$ is the cell Peclet number calculated at w . This hybrid scheme is denoted by HS.

Figure 13 shows the nondimensional flux passing the mid-plane at $x - \delta x/2$ versus Peclet number Pe . Four lines are shown representing the exact solution ES, the hybrid scheme HS, the central difference scheme CDS and the upwind difference scheme UDS. These lines show the overall superiority of the HS over the CDS and UDS approaches, for the particular case considered in Appendix C. However, the result is quite general.³⁰ These different schemes and the superiority of the hybrid scheme recommended and used in this work⁷ are fully discussed in Appendix C.

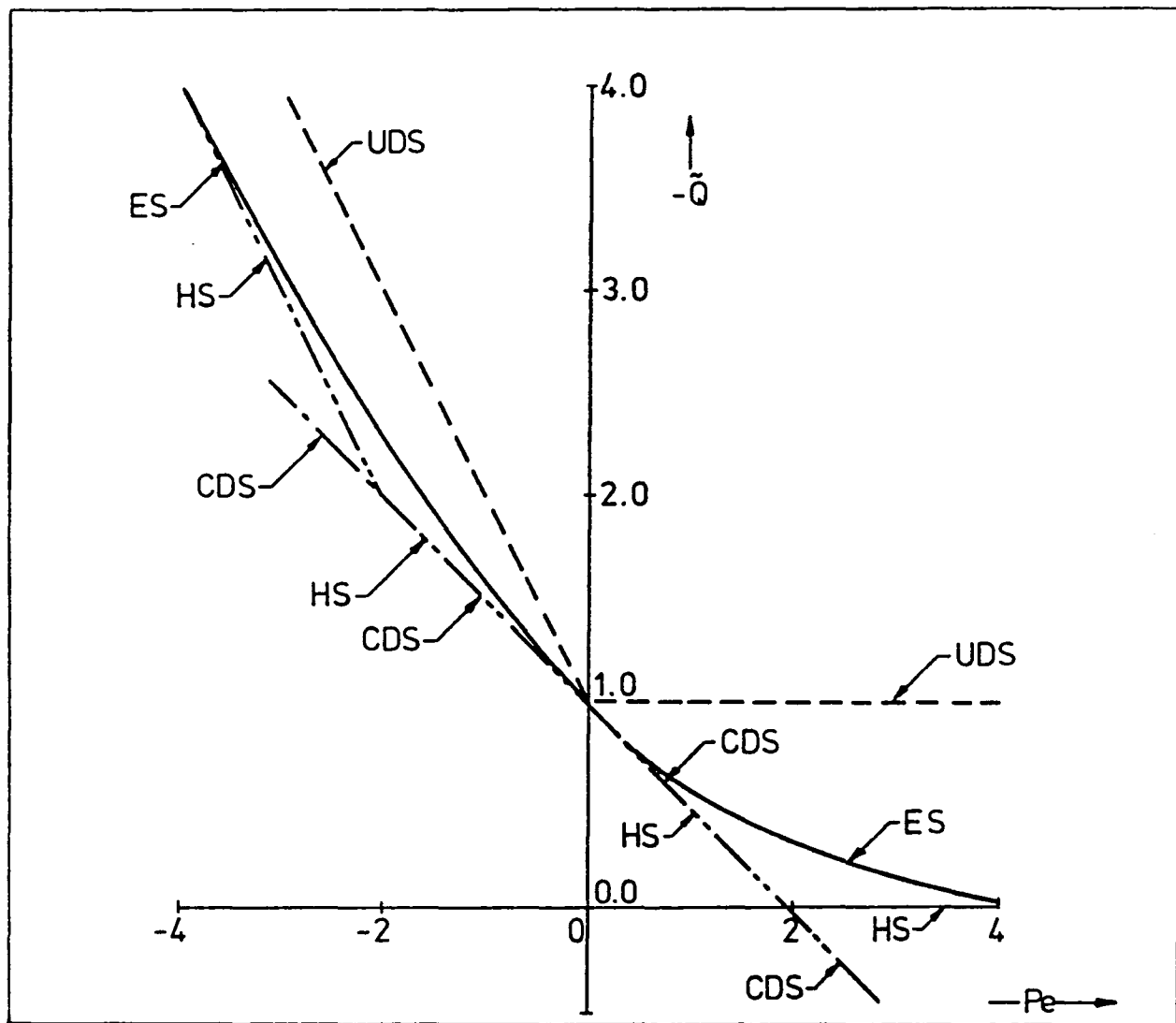


Fig. 13. Comparison of exact flux passing through western face with other approaches, as a function of Peclet number (ES, CDS, UDS, AND HS are described in Appendix C).

APPENDIX B DERIVATION OF EQ. (A7) FROM EQ. (A6)

Equation (A4) gives ϕ and $\frac{\partial \phi}{\partial x}$ evaluated at $x = \delta x/2$ as

$$\phi_{\delta x/2} = \phi_W + (\phi_P - \phi_W) \frac{e^{Pe/2} - 1}{e^{Pe} - 1} \quad (B1)$$

and

$$\left. \frac{\partial \phi}{\partial x} \right|_{\delta x/2} = (\phi_P - \phi_W) \cdot \frac{1}{e^{Pe} - 1} \cdot \frac{Pe}{\delta x} \cdot e^{Pe/2} \quad (B2)$$

Substitution into Eq. (A6) gives, where $\rho u = (\rho u)_{\delta x/2}$:

$$\begin{aligned} Q_{\delta x/2} &= \rho u \left\{ \phi_W + (\phi_P - \phi_W) \frac{e^{Pe/2} - 1}{e^{Pe} - 1} \right\} \\ &\quad - \Gamma_\phi \left\{ (\phi_P - \phi_W) \frac{1}{e^{Pe} - 1} \cdot \frac{Pe}{\delta x} \cdot e^{Pe/2} \right\} \\ &= \rho u \phi_W \left\{ 1 - \frac{e^{Pe/2} - 1}{e^{Pe} - 1} + \frac{e^{Pe/2}}{e^{Pe} - 1} \right\} \\ &\quad + \rho u \phi_P \left\{ \frac{e^{Pe/2} - 1}{e^{Pe} - 1} - \frac{e^{Pe/2}}{e^{Pe} - 1} \right\} \end{aligned} \quad (B3)$$

on substituting for Γ_ϕ in terms of the Peclet number $Pe = \rho u \delta x / \Gamma_\phi$.

continuing

$$\begin{aligned} Q_{\delta x/2} &= \rho u \phi_W \left\{ \frac{e^{Pe} - 1 + 1}{e^{Pe} - 1} \right\} + \rho u \phi_P \left\{ \frac{-1}{e^{Pe} - 1} \right\} \\ &= (\rho u)_{\delta x/2} \left\{ \phi_W \frac{e^{Pe}}{e^{Pe} - 1} - \phi_P \frac{1}{e^{Pe} - 1} \right\} \end{aligned} \quad (B4)$$

which is equivalent to Eq. (A7).

APPENDIX C THE SUPERIORITY OF THE HYBRID DIFFERENCING SCHEME

Here the concern is with exhibiting possible finite difference analogues of Eq. (A7) which expresses the exact solution for the flux $Q = Q_{\delta x/2}$ passing the mid-plane $x = \delta x/2$, as a function of local density and axial velocity evaluated at this point $\rho u = (\rho u)_{\delta x/2}$, the local Peclet number Pe and the ϕ -values at W and P. Three limiting cases for $Pe \rightarrow +\infty$, $Pe \rightarrow -\infty$ and $|Pe| \rightarrow 0$ were given in Eqs. (A8) - (A11), the first two being upstream convection dominated and the last one being equivalent to simple averaging for the convection term and central differencing for the diffusion term.

In computing it is advantageous to use a finite difference analogue of Eq. (A2) which gives the best fit for this flux Q over a range of ρ , u , Γ and δx likely to be encountered, as expressed via the Peclet number Pe . The suffix ϕ on Γ is omitted from here onward to avoid confusion. Nonsubscripted variables are evaluated at $x = \delta x/2$. The three popular practices, and the exact solution, are:

(i) CDS - the central difference scheme. For all Pe numbers, use

$$Q = \rho u (\phi_P + \phi_W)/2 - \Gamma(\phi_P - \phi_W)/\delta x \quad (C1)$$

(ii) UDS - the upstream difference scheme. For all Pe numbers, use

$$Q = \begin{cases} \rho u \phi_W - \Gamma(\phi_P - \phi_W)/\delta x & (u > 0) \\ \rho u \phi_P - \Gamma(\phi_P - \phi_W)/\delta x & (u < 0) \end{cases} \quad (C2)$$

(iii) HS - the hybrid scheme. According to Pe and u , use (see Eq. (A13)):

$$Q = \begin{cases} \rho u (\phi_P + \phi_W)/2 - \Gamma(\phi_P - \phi_W)/\delta x & (|Pe| < 2) \\ \rho u \phi_W & (Pe \geq 2, u > 0) \\ \rho u \phi_P & (Pe \leq -2, u < 0) \end{cases} \quad (C3)$$

(iv) ES - the exact solution. According to Pe number, use (see Eq. (A7)):

$$Q = \rho u \left\{ \frac{\phi_W e^{Pe}}{e^{Pe} - 1} - \phi_P \frac{e^{-Pe}}{1 - e^{-Pe}} \right\} \quad (C4)$$

We wish to determine which of the CDS, UDS or HS is generally the best to use as an approximation to ES, over a range of Pe numbers. Nondimensionalizing the fluxes via

$$\hat{Q} = Q \cdot \frac{\delta x}{\Gamma} \cdot \frac{1}{\phi_P - \phi_W} \quad (C5)$$

gives the following forms (using $Pe = \rho u \delta x / \Gamma$ when required):

$$(i) \text{ CDS } \hat{Q} = \frac{1}{2} \cdot Pe \cdot \frac{\phi_P + \phi_W}{\phi_P - \phi_W} - 1 \quad (C6)$$

$$(ii) \text{ UDS } \hat{Q} = \begin{cases} Pe \cdot \frac{\phi_W}{\phi_P - \phi_W} - 1 & (u > 0) \\ Pe \cdot \frac{\phi_P}{\phi_P - \phi_W} - 1 & (u < 0) \end{cases} \quad (C7)$$

$$(iii) \text{ HS } \hat{Q} = \begin{cases} \frac{1}{2} \cdot Pe \cdot \frac{\phi_P + \phi_W}{\phi_P - \phi_W} - 1 & (|Pe| < 2) \\ Pe \cdot \frac{\phi_W}{\phi_P - \phi_W} & (Pe \geq 2, u > 0) \\ Pe \cdot \frac{\phi_P}{\phi_P - \phi_W} & (Pe \leq 2, u < 0) \end{cases} \quad (C8)$$

$$(iv) \text{ ES } \hat{Q} = Pe \left\{ \frac{\phi_W e^{Pe}}{e^{Pe} - 1} - \frac{\phi_P e^{-Pe}}{1 - e^{-Pe}} \right\} \quad (C9)$$

It is useful to examine limiting cases of the ES, in a manner similar to that used in obtaining Eqs. (A8) - (A11). Now they are

$$\hat{Q} \rightarrow \begin{cases} -1 & (|PE| \rightarrow 0) \\ Pe \cdot \frac{\phi_W}{\phi_P - \phi_W} & (Pe \rightarrow +\infty) \\ Pe \cdot \frac{\phi_P}{\phi_P - \phi_W} & (Pe \rightarrow -\infty) \end{cases} \quad (C10)$$

In order to discriminate between the CDS, UDS and HS approaches to approximating the ES, we plot \hat{Q} versus Pe . The plot depends, of course, on the values of ϕ_P and ϕ_W . To illustrate the point, and without loss of generality of the result, let us take $\phi_W = 0$ and $\phi_P = 1$. For this case the \hat{Q} versus Pe relationships to plot are:

(i) CDS

$$\hat{Q} = \frac{1}{2} Pe - 1 \quad (C11)$$

(ii) UDS

$$\hat{Q} = \begin{cases} -1 & (u > 0) \\ Pe - 1 & (u < 0) \end{cases} \quad (C12)$$

(iii) HS

$$\hat{Q} = \begin{cases} \frac{1}{2} Pe - 1 & (|Pe| < 0) \\ 0 & (Pe \geq 2, u > 0) \\ Pe & (Pe \leq -2, u < 0) \end{cases} \quad (C13)$$

(iv) ES

$$\hat{Q} = -Pe \cdot \frac{e^{-Pe}}{1 - e^{-Pe}} \quad (C14)$$

The three limiting cases of the ES are also

$$\hat{Q} \rightarrow \begin{cases} -1 & (|Pe| \rightarrow 0) \\ 0 & (Pe \rightarrow +\infty) \\ -Pe & (Pe \rightarrow -\infty) \end{cases} \quad (C15)$$

In Fig. 13 are plotted four lines labelled CDS, UDS, HS and ES, each of which represents \hat{Q} as a function of Pe . That marked ES represents the exact solution and its three limiting cases are clearly seen. When $|Pe|$ is small, ES tends to -1 ; this is the value appropriate to \hat{Q} because of diffusion alone. When Pe is very large and positive, \hat{Q} tends to 0 ; when Pe is very large in magnitude, but negative, \hat{Q} tends to be equal to $-Pe$. With the CDS approach, \hat{Q} tends to $\frac{1}{2}Pe$ instead of zero when Pe is large and positive, and at the other extreme it tends to $\frac{1}{2}Pe$ instead of Pe . These disagreements are quite severe. And, of course, the finite difference equation coefficients obtained with the CDS approach when $|Pe| > 2$ are such as to encourage divergence during an iterative solution procedure. The UDS approach of the other hand, has errors which are larger than the CDS approach for moderate values of Pe , but when $|Pe|$ is large the UDS solution is more exact than the CDS one.

The HS approach combines the advantages of the CDS and UDS ideas and its corresponding straight lines are marked on the figure. Evidently this prescription is somewhat more accurate, overall, than either of its associated predecessors. It clearly tends to the asymptotes of 0 and $-Pe$, as Pe tends to $+\infty$ and $-\infty$ respectively (making it superior to the UDS for large values of $|Pe|$), and is equivalent to the CDS approach where the latter may be usefully employed when $|Pe| < 2$. The HS approach also happens to keep the finite difference coefficients within bounds which

ensure convergence of the iterative scheme for solving the resulting set of algebraic equations. Hence the recommendation and current use of the hybrid differencing scheme as given by Eq. (A13), and quoted earlier as Eq. (10).

APPENDIX D FORTRAN SYMBOL LIST

A(J)	=	Coefficient of recurrence relation
AE(I,J)	=	Coefficient of combined convective/diffusive flux through east-wall of control volume
AL1	=	X-coordinate of inlet boundary of flow domain
AL2	=	X-coordinate of outlet boundary of flow domain
ALAMDA	=	Length scale factor at inlet of flow domain
ALPHA	=	Inlet sloping wall expansion angle
ALTOT	=	Total length of pipe of larger diameter
AN(I,J)	=	Coefficient of combined convective/diffusive flux through north-wall of control volume
AP(I,J)	=	Sum of coefficients of combined convective/diffusive fluxes through all four walls of control volume
AREAEW	=	Area of east/west wall of control volume
AREAN	=	Area of north-wall of control volume
AREAS	=	Area of south-wall of control volume
ARDEN	=	Area of east/west cell-wall times density of fluid
ARDENT	=	Sum of all east/wall ARDEN at a cross-section
AS(I,J)	=	Coefficient of combined convective/diffusive flux through south-wall of control volume
AW(I,J)	=	Coefficient of combined convective/diffusive flux through west-wall of control volume
B(J)	=	Coefficient of recurrence formulae
C(J)	=	Coefficient of recurrence relation
C1	=	Constant of turbulence model (=1.44)
C2	=	Constant of turbulence model (=1.92)
CAPPA	=	Von Karman constant (=0.4187)

CD = Constant of turbulence model (=1.0)
 CDTERM = $CMU * 0.25$
 CE = Coefficient of convective flux through east-wall of control volume
 CMU = Constant of turbulence model (=0.09)
 CN = Coefficient of convective flux through north-wall of control volume
 CP = Maximum of zero and net outflow (SMP) from control volume
 CPO = CP
 CS = Coefficient of convective flux through south-wall of control volume
 CW = Coefficient of convective flux through west-wall of control volume
 D(J) = Coefficient of recurrence formulae
 DE = Coefficient of diffusive flux through east-wall of control volume
 DEN(I,J) = Density of fluid
 DENSIT = Density of fluid at inlet of the calculation domain
 DITERM = Coefficient of volume integral of energy dissipation rate in vicinity of walls
 DN = Coefficient of diffusive flux through north-wall of control volume
 DS = Coefficient of diffusive flux through south-wall of control volume
 DU(I,K) = Coefficient of velocity-correction term for U velocity
 DUDXE = $\partial u / \partial x$ at eastern face of U-cell
 DUDXW = $\partial u / \partial x$ at western face of U-cell
 DUDX = $\partial u / \partial x$ at main grid node (I,J)

DUDY = $\partial u / \partial y$ at main grid node (I,J)
 DUDYE = $\partial u / \partial y$ at mid-point of east wall of V-cell
 DUDYW = $\partial u / \partial y$ at mid-point of west wall of V-cell
 DVDX = $\partial v / \partial x$ at main grid node (I,J)
 DVDXN = $\partial v / \partial x$ at mid-point of north wall of U-cell
 DVDXS = $\partial v / \partial x$ at mid-point of south wall of U-cell
 DVDY = $\partial v / \partial y$ at main grid node (I,J)
 DVDYN = $\partial v / \partial y$ at mid-point of north wall of V-cell
 DVDYS = $\partial v / \partial y$ at mid-point of south wall of V-cell
 DW = Coefficient of diffusive flux through west wall of control volume
 DWDX = $\partial W / \partial x$ at main grid node (I,J)
 DWDY = $\partial W / \partial y$ at main grid node (I,J)
 DXEP(I) = $X(I+1) - X(I)$
 DXEPU(I) = $XU(I+1) - XU(I)$
 DXPW(I) = $X(I) - X(I-1)$
 DYNP(J) = $Y(J+1) - Y(J)$
 DYNPV(J) = $YV(J+1) - YV(J)$
 DYPS(J) = $Y(J) - Y(J-1)$
 DYPSV(J) = $YV(J) - YV(J-1)$
 ED(I,J) = Energy dissipation rate, ϵ
 EDIN = Energy dissipation rate at inlet of flow domain (ϵ_{in})
 ELOG = Constant of P-function for heat transfer at walls (=9.793)
 EPSX = Grid expansion factor in axial direction
 FACTOR = Area ratio for setting initial u-velocity field
 FLOW = Mass flow rate at a cross-section based on calculated velocity
 FLOWIN = Total mass flow rate entering pipes

GE = Mass flux through east-wall of cell
 GEN(I,J) = Generation of turbulence by shear from mean flow
 GENCOU = Part of generation term modified in terms of wall shear stress
 GENRES = Total unmodified generation of turbulence (GEN(I,J) less $\mu_t(\partial v/\partial x)^2$.
 GN = Mass flux through north-wall of cell
 GNW = Mass flux through north-wall of u-cell
 GP = Mass flux at location of velocity
 GREAT = A very large value (10^{30})
 GS = Mass flux through south-wall of cell
 GSW = Mass flux through south-wall of u-cell
 HEDA = Heading 'KPLUS = TE * RHO/TAUN'
 HEDB = Heading 'LENGTH SCALE/PIPE RADIUS'
 HEDD = Heading 'ENERGY DISSIPATION'
 HEDDK = Heading 'DIMENSIONLESS TURBULENCE ENERGY'
 HEDDP = Heading 'DIMENSIONLESS PRESSURE'
 HEDDSL = Heading 'DIMENSIONLESS STREAMLINE COORDS'
 HEDDU = Heading 'DIMENSIONLESS U VELOCITY'
 HEDDV = Heading 'DIMENSIONLESS V VELOCITY'
 HEDDVS = Heading 'DIMENSIONLESS EFF. VISCOSITY'
 HEDDW = Heading 'DIMENSIONLESS W VELOCITY'
 HEDK = Heading 'TURBULENCE ENERGY'
 HEDM = Heading 'VISCOSITY'
 HEDP = Heading 'PRESSURE'
 HEDSF = Heading 'DIMENSIONLESS STREAM FUNCTION'
 HEDSL = Heading 'RADIAL COORDINATE OF STREAMLINES'
 HEDT = Heading 'TEMPERATURE'

HEDU	=	Heading 'U VELOCITY'
HEDV	=	Heading 'V VELOCITY'
I	=	Index for dependent variables, and co-ordinates
IFINE	=	Logical parameter for fine x-direction grid spacing
IMON	=	I-index of monitoring location
INCALA	=	Additional (unused) logical parameter for selection of dependent variables
INCALB	=	Additional (unused) logical parameter for selection of dependent variables
INCALD	=	Logical parameter for solution of ϵ -equation
INCALK	=	Logical parameter for solution of k-equation
INCALM	=	Additional (unused) logical parameter for selection of dependent variables
INCALP	=	Logical parameter for solution of P'-equation
INCALS	=	Logical parameter for calculation of stream function
INCALU	=	Logical parameter for solution of U-equation
INCALV	=	Logical parameter for solution of V-equation
INCALW	=	Logical parameter for solution of W-equation
INDCOS	=	Control index for definition of co-ordinate system (= 1 for plane flows; = 2 for axisymmetric flows)
INITAL	=	Logical parameter to print initial field estimates
INPLOT	=	Logical parameter to produce line printer streamline plots
IREAD	=	Logical parameter to read initial field values from allocated disk storage
IWRITE	=	Logical parameter to write solution field values to allocated disk storage
INPRO	=	Logical parameter for updating of fluid properties
IPREF	=	I-index of location where pressure is fixed

IPRINT = If equal to NITER, activates printing of residual sums and
 monitor values of field variables
 ISTEP = I-index of entrance plane, within calculation domain
 ISTMI = ISTEP-1
 ISTPI = ISTEP+1
 IT = I-index of maximum dimension of dependent variables
 J = Index for dependent variables, and co-ordinate
 JMAX(I) = Maximum value of j-index within flow domain
 JMON = J-index of monitoring location
 JPREF = J-index of location where pressure is fixed
 JPRINT = If equal to NITER, activates printing of field variable values
 JSTEP = J-index of horizontal plane next to wall of, and within,
 smaller pipe
 JSTMI = JSTEP-1
 JSTPI = JSTEP+1
 JT = J-index of maximum dimension of dependent variables
 LFS = Index for counting loops for swirl
 LFSMAX = Number of swirl loops to be run
 MAXIT = Maximum number of iterations to be completed if iteration
 sequence is not stopped by test on value of SORCE
 NI = Maximum value of I-index
 NIMI = NI-1
 NITER = Number of iterations completed
 NJ = Maximum value of J-index
 NJMI = NJ-1
 NJM2 = NJ-2

NONDIM	-	Activates the calculation and printing of dimensionless solution when specified as true
NSBR	=	Zero value specifies flat W profile; the value one specifies solid body rotation
NSTLN	=	Number of streamlines calculated
NSWPD	=	Number of application of line iteration for ϵ -equation
NSWPK	=	Number of application of line iteration for k-equation
NSWPP	=	Number of application of line iteration for P'-equation
NSWPU	=	Number of application of line iteration for U-equation
NSWPW	=	Number of application of line iteration for W-equation
P(I,J)	=	Pressure, P
PHI(I,J)	=	General representation for all dependent variables, ϕ
PP(I,J)	=	Pressure-correction, P'
PRANDT	=	Turbulent Prandtl number
PRED	=	Constant of turbulence model in ϵ -equation, σ_ϵ
PRTE	=	Constant of turbulence model in k-equation, σ_k
PSTAR(I,J)	=	Dimensionless pressure
R(J)	=	Radius of main grid node (I,J) from symmetry axis
RCV(J)	=	Radius of C- and U-cell center
RESOR	=	Residual source for individual control volume
RESORE	=	Sum of residual sources within calculation domain for ϵ -equation
RSORK	=	Sum of residual sources within calculation domain for k-equation
RESORM	=	Sum of mass sources within calculation domain
RESORU	=	Sum of residual sources within calculation domain for U-equation
RESORV	=	Sum of residual sources within calculation domain for V-equation
RESORW	=	Sum of residual sources within calculation domain
RLARGE	=	Radius of large pipe

RSDRL = RSMALL/RLARGE
 RSMALL = Radius of small pipe
 RV(J) = Radius of location of V(I,J) from symmetry axis
 SEW(I) = $0.5*(DXEP(I) + DXPW(I))$
 SEWU(I) = $0.5*(DXEPU(I) + DXPWU(I))$
 SMP = Net outflow from control volume
 SNS(J) = $0.5*(DYNP(J) + DYPS(J))$
 SNSV(J) = $0.5*(DYNPV(J) + DYPSV(J))$
 SORCE = Maximum of RESORM, RESORU, RESORV, RESORW, RESORK
 SORMAX = Maximum acceptable value of SORCE for converged solution
 SORVOL = GREAT * VOL
 SP(I,J) = Coefficient of linearized source treatment
 SPKD(I,J) = -CP, for k- and ϵ -equations
 SSC = Shear-stress coefficient
 STFN(I,J) = Dimensionless stream function
 STVAL(K) = Stream function value of streamlines
 SU(I,J) = Coefficient of linearized source treatment
 SUKD(I,J) = $CP0 * TE(I,J)$, for k-equation
 = $CP0 * ED(I,J)$, for ϵ -equation
 SWNB(LFS) = Inlet swirl number specification of WINST
 SWRLNO = Calculated inlet swirl number
 TAUN(I) = Shear stress at north wall-boundary of flow domain
 TAURX = North wall shear stress, x-component
 TAURW = North wall shear stress, θ -component
 TAUW(J) = Shear stress at west wall-boundary of flow domain
 TAUXR = West wall shear stress, r-component
 TAUW = West wall shear stress, θ -component
 TE(I,J) = Turbulence energy, k

TESTAR(I,J)= Dimensionless turbulence energy
 TEIN = Turbulence energy at inlet of flow domain (k_{in})
 TMULT = Coefficient of wall shear-stress expression
 TURBIN = Turbulence intensity factor at inlet of flow domain
 U(I,J) = Component of mean velocity in axial direction (u-velocity)
 UEFF = $SQRT[U(I,J)**2 + W(I,J)**2]$
 UIN = U-velocity at inlet of flow domain
 UINC = Uniform increment of u-velocity at outlet of flow domain
 ULARGE = $UIN * (RSMALL/RLARGE)**2$
 UMEAN = Mean u-velocity at inlet
 URFE = Under-relaxation factor for energy dissipation
 URFK = Under-relaxation factor for turbulence energy
 URFP = Under-relaxation factor for pressure-correction
 URFU = Under-relaxation factor for u-velocity
 URFV = Under-relaxation factor for v-velocity
 URFVIS = Under-relaxation factor for viscosity
 URFW = Under-relaxation factor for w-velocity
 USTAR(I,J)= Dimensionless u-velocity
 V(I,J) = Component of mean velocity in radial direction (v-velocity)
 VANB(LFS) = Swirl vane angle
 VAVG = Average v-velocity between nodes (I,J) and (I,J+1)
 VDR = $V(I,J)/RV(J)$
 VIS(I,J) = Effective viscosity
 VISCOS = Laminar viscosity
 VISE = Effective viscosity at mid-point of east-wall of cell

VISOLD = Value of effective viscosity before underrelaxation
 VISN = Effective viscosity at mid-point of north-wall of cell
 VISS = Effective viscosity at mid-point of south-wall of cell
 VISTAR(I,J)= Dimensionless effective viscosity
 VISW = Effective viscosity at mid-point of west-wall of cell
 VOL = Volume of cell or control-volume
 VSTAR(I,J)= Dimensionless v-velocity
 W(I,J) = w-velocity
 WIN = Inlet w-velocity from swirl vanes
 WINST = Inlet w-velocity at JSTEP from solid body rotation swirl generator
 WMONIN = Inlet swirl momentum
 WSTAR(I,J)= Dimensionless w-velocity
 X(I) = Distance from inlet plane in axial direction
 XMONIN = Momentum of fluid at inlet of flow domain
 XND(I) = Dimensionless X(I)
 XPLUSW(I) = Local Reynolds number based on friction velocity and distance from west wall-boundary of flow domain
 XU(I) = X-coordinate of storage location of U(I,J)
 XUDPLT(I) = Dimensionless XU(I) required for line printer streamline plots
 Y(J) = Distance from symmetry axis in radial direction
 YND(J) = Dimensionless Y(J)
 YPLUSN(J) = Local Reynolds number based on friction velocity and distance from north wall-boundary of flow domain
 YSLOPE = Height of first stairstep along sloping wall
 YSLPLT(N,I)= Dimensionless YSTLN(I,K) required for line printer streamline plots

YSTLN(I,K) = Radial coordinate of points representing streamlines
YSTLND(I,K) = Dimensionless YSTLN(I,K)
YV(J) = Y-coordinate of storage location of V(I,J)
YUND(J) = Dimensionless YV(J)

APPENDIX E COMPUTER PROGRAM LISTING

The computer program listing obtained for the sample computation
described in Section 4.3 is now given.

```

C      SUBROUTINE CONTRO                                0000100
C                                                         0000200
CA*****                                                0000300
C                                                         0000400
C                                                         0000500
C      A COMPUTER PROGRAM FOR TURBULENT, SWIRLING, RECIRCULATING, 0000600
C      FLOW IN COMBUSTOR GEOMETRIES                        0000700
C                                                         0000800
C      VERSION OF APRIL, 1981                             0000900
C                                                         0001000
C      D L RHODE & D G LILLEY                             0001100
C      MECHANICAL AND AEROSPACE ENGINEERING              0001200
C      OKLAHOMA STATE UNIVERSITY                         0001300
C      STILLWATER, OK      74078                         0001400
C                                                         0001500
C                                                         0001600
CA*****                                                0001700
CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0 0001800
C                                                         0001900
C      DIMENSION HEDU(9), HEDV(9), HEDW(9), HEDP(9), HEDT(9), HEDK(9), 0002000
C      *HEDD(9), HEDM(9), HEDL(9), VANB(7), SWNB(7), HEDSF(9), HEDSL(9), 0002100
C      #HEDDU(9), HEDDV(9), HEDDW(9),                    0002200
C      #HEDDP(9), HEDDK(9), HEDDSL(9), HEDDVS(9)          0002300
C      DIMENSION YAXES(10), SYMB L(10)                   0002400
C      COMMON                                              0002500
C      1/UVEL/RESORU, NSWPU, URFU, DXEPU(48), DXPWU(48), SEWU(48) 0002600
C      1/VVEL/RESORV, NSWPV, URFV, DYNPV(24), DYP5V(24), SHSV(24) 0002700
C      */UVEL/ RESORW, NSWPW, URFW                        0002800
C      1/PCOR/RESORM, NSWPP, URFPP, DU(48,24), DV(48,24), IPREF, JPREF 0002900
C      1/TEN/RESORK, NSWPK, URFK                          0003000
C      1/TDIS/RESORE, NSWPD, URFE                          0003100
C      */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0003200
C      *ED(48,24), STFN(48,24), YSTLN(48,24), STVAL(24), USTAR(48,24), 0003300
C      *VSTAR(48,24), WSTAR(48,24), PSTAR(48,24), TESTAR(48,24), YSTLND(48,24) 0003400
C      #, VISTAR(48,24)                                   0003500
C      1/ALL/IT, JT, NI, NJ, NIM1, NJM1, GREAT, JMAX(48), JMAXP1(48) 0003600
C      1/GEOM/INDCOS, X(48), Y(24), DXEP(48), DXPW(48), DYNP(24), DYP5(24), 0003700
C      1      SN5(24), SEW(48), XU(48), YV(24), R(24), RV(24), 0003800
C      # WFN(24), WFS(24), WFE(48), WFW(48), RCV(24), XND(48), XUND(48), 0003900
C      #YND(24), YVND(24)                                0004000
C      COMMON                                              0004100
C      1/FLUPR/URFVIS, VISCOS, DENSIT, PRANDT, DEN(48,24), VIS(48,24) 0004200
C      1/KASE T1/ UIN, TEIN, EDIN, FLOWIN, ALAMDA,        0004300
C      2      RSMALL, RLARGE, AL1, AL2, JSTEP, ISTEP, JSTP1, JSTM1, ISTP1, ISTM1 0004400
C      1/TURB/GEN(48,24), CD, CMU, C1, C2, CAPPA, ELOG, PRED, PRTE 0004500
C      1/WALLF/YPLUSN(48), XPLUSW(24), TAUN(48), TAUW(24) 0004600
C      1/COEF/AP(48,24), AN(48,24), AS(48,24), AE(48,24), AW(48,24), SU(48,24), 0004700
C      1      SP(48,24)                                   0004800
C      1/PLOTT/NSTLN, NPLTLN, NPTS, YSLPLT(10,48), XUDPLT(48), INPLOT 0004900
C      LOGICAL INCALU, INCALV, INCALW, INCALP, INPRO, INCALK, INCALD, INCALM, 0005000
C      *INCALA, INCALB, INCALS, INPLOT, IWRITE, NONDIM, IREAD, INLET, 0005100
C      *INITAL, IFINE                                     0005200
C-----ALL PRIMARY USER INPUTS ARE LOCATED HERE      0005300
C      DATA VANB /0.,45.,55.,60.,65.,68.,70./          0005400
C      #,SWNB/0.,.5,1.0,1.25,1.50,1.75,2.0/             0005500
C      DATA XAXIS /3HXI /                                0005600
C      DATA YAXES /3H 00,3H 02,3H 04,3H 06,3H 08,3H 10, 0005700
C      #3H 06,3H 07,3H 08,3H 09/                         0005800
C      DATA SYMB L /1H0,1H2,1H4,1H6,1H8,1H1,1H6,1H7,1H8,1H9/ 0005900
C-----DELETE UNDERFLOW ERROR MESSAGES, CALL TRAPS WHEN USING WATFIV 0006000

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C-----CALL TRAPS(1,1,4000)	0006100
CALL ERRSET(208,256,-1,1,0,0)	0006200
C-----SET INPLOT=.TRUE. ONLY FOR STREAMLINE LINE-PRINTER PLOT	0006300
INPLOT=.TRUE.	0006400
C-----SET IWRITE=.TRUE. ONLY FOR WRITING SOLN. ON DATA FILES	0006500
IWRITE=.FALSE.	0006600
C-----SET NONDIM=.TRUE. ONLY FOR PRINTING DIMENSIONLESS SOLN.	0006700
NONDIM=.TRUE.	0006800
C-----SET IREAD=.TRUE. ONLY FOR READING INITIAL GUESS OF SOLN.	0006900
C-----FROM DATA FILES	0007000
IREAD=.FALSE.	0007100
C-----SET INITIAL=.TRUE. ONLY FOR PRINTING INITIAL GUESS OF SOLN.	0007200
INITAL=.TRUE.	0007300
C-----SET IFINE=.TRUE. ONLY FOR FINE GRID IN X-DIRECTION	0007400
IFINE=.FALSE.	0007500
IF(.NOT. IREAD) GO TO 150	0007600
READ(12) X	0007700
READ(12) Y	0007800
150 CONTINUE	0007900
NSTLN=11	0008000
NPLTLN=6	0008100
MAXLN=10	0008200
NITER=0	0008300
JPRINT=NITER+300	0008400
IPRINT=NITER+1	0008500
LFS=1	0008600
LFSMAX=7	0008700
NSBR=0	0008800
MAXIT=NITER+200	0008900
C-----SEE STATEMENT 304 FOR MAXIT SPEC. FOR FURTHER SWIRL CASES	0009000
DENSIT=1.211	0009100
IT=48	0009200
JT=24	0009300
GREAT=1.E30	0009400
NSWPU=4	0009500
NSWPV=3	0009600
NSUPW=3	0009700
NSWPP=5	0009800
NSWPK=3	0009900
NSWPD=3	0010000
READ(5,10) HEDU,HEDV,HEDW,HEDP,HEDT,HEDK,HEDD,HEDM,HEDL,	0010100
\$HEDSF,HEDSL,HEDDU,HEDDV,HEDDW,HEDDP,HEDDK,HEDDSL,HEDDVS	0010200
010 FORMAT(9A4)	0010300
C	0010400
CHAPTER 1 1 1 1 1 PARAMETERS AND CONTROL INDICES 1 1 1 1 1 1	0010500
C	0010600
C-----GRID	0010700
ISTEP=2	0010800
JSTEP=8	0010900
INDCOS=2	0011000
NJ=21	0011100
NJM1=NJ-1	0011200
ISTP1=ISTEP+1	0011300
ISTM1=ISTEP-1	0011400
JSTP1=JSTEP+1	0011500
JSTM1=JSTEP-1	0011600
RLARGE=.0625	0011700
ALTOT=.375	0011800
IF(IFINE) GO TO 120	0011900
C-----COARSE MESH GRID LINES IN X-DIRECTION	0012000

	NI=20	0012100
	NIM1=NI-1	0012200
	EPSX=1.11	0012300
	IF(EPSX-1.) 13,12,13	0012400
13	SUMX=0.5*EPSX**((NI-4)+(EPSX**((NI-3)-1.)/(EPSX-1.))+0.5	0012500
	GO TO 15	0012600
12	CONTINUE	0012700
	SUMX=NIM1-1	0012800
15	DX=ALTOT/SUMX	0012900
	X(1)=-.5*DX	0013000
	X(2)=-X(1)	0013100
	DO 100 I=3,NIM1	0013200
	X(I)=X(I-1)+DX	0013300
100	DX=EPSX*DX	0013400
	X(NI)=X(NIM1)+(X(NIM1)-X(NI-2))	0013500
	X(21)=X(20)+(X(20)-X(19))	0013600
	X(22)=X(21)+(X(20)-X(19))	0013700
	X(23)=X(22)+(X(20)-X(19))	0013800
	NI=23	0013900
	NIM1=NI-1	0014000
	ALTOT=(X(22)+X(23))/2.	0014100
	AL1=0.5*(X(ISTEP)+X(ISTM1))	0014200
	AL2=ALTOT-AL1	0014300
C-----	-----FINE MESH GRID LINES IN X-DIRECTION	0014400
	IF(.NOT. IFINE) GO TO 130	0014500
120	NI=30	0014600
	NIM1=NI-1	0014700
	EPSX=1.102	0014800
	IF(EPSX-1.) 17,16,17	0014900
17	SUMX=0.5*EPSX**((NI-4)+(EPSX**((NI-3)-1.)/(EPSX-1.))+0.5	0015000
	GO TO 18	0015100
16	CONTINUE	0015200
	SUMX=NIM1-1	0015300
18	DX=ALTOT/SUMX	0015400
	X(1)=-.5*DX	0015500
	X(2)=-X(1)	0015600
	DO 170 I=3,NIM1	0015700
	X(I)=X(I-1)+DX	0015800
170	DX=EPSX*DX	0015900
	X(NI)=X(NIM1)+(X(NIM1)-X(NI-2))	0016000
	DO 180 L=31,35	0016100
180	X(L)=X(L-1)+(X(NI)-X(NIM1))	0016200
	NI=35	0016300
	NIM1=NI-1	0016400
	ALTOT=(X(NIM1)+X(NI))/2.	0016500
	AL1=0.5*(X(ISTEP)+X(ISTM1))	0016600
	AL2=ALTOT-AL1	0016700
C-----	-----SPECIFY RADIAL HEIGHT(NO. OF J-CELLS) OF COMBUSTOR	0016800
C-----	-----WALL FOR EACH I GRID LINE	0016900
130	CONTINUE	0017000
	JMAX(1)=JSTEP	0017100
	JMAXP1(1)=JMAX(1)+1	0017200
	DO 160 I=2,NI	0017300
	JMAX(I)=JMAX(I-1)+3	0017400
	IF(JMAX(I-1) .EQ. NJM1) JMAX(I)=JMAX(I-1)	0017500
160	JMAXP1(I)=JMAX(I)+1	0017600
C-----	-----GRID LINES IN Y-DIRECTION	0017700
	Y(1)=-1.5625E-3	0017800
	Y(2)=1.5625E-3	0017900
	Y(3)=5.625E-3	0018000

Y(4)=1.0625E-2	0018100
Y(5)=1.625E-2	0018200
Y(6)=2.1875E-2	0018300
Y(7)=2.6875E-2	0018400
Y(8)=3.03125E-2	0018500
Y(9)=3.21875E-2	0018600
Y(10)=3.4375E-2	0018700
Y(11)=3.71875E-2	0018800
Y(12)=4.09375E-2	0018900
Y(13)=4.328125E-2	0019000
Y(14)=4.5625E-2	0019100
Y(15)=4.8125E-2	0019200
Y(16)=5.078125E-2	0019300
Y(17)=5.34375E-2	0019400
Y(18)=5.59375E-2	0019500
Y(19)=5.9375E-2	0019600
Y(20)=6.1875E-2	0019700
Y(21)=6.3125E-2	0019800
RSMALL=0.5*(Y(JSTEP)+Y(JSTP1))	0019900
C-----DEPENDENT VARIABLE SELECTION	0020000
INCALU=.TRUE.	0020100
INCALV=.TRUE.	0020200
INCALW=.TRUE.	0020300
INCALP=.TRUE.	0020400
INCALK=.TRUE.	0020500
INCALD=.TRUE.	0020600
INPRO=.TRUE.	0020700
INCALS=.TRUE.	0020800
C-----FLUID PROPERTIES	0020900
C-----TURBULENCE CONSTANTS	0021000
CMU=0.09	0021100
CD=1.00	0021200
C1=1.44	0021300
C2=1.92	0021400
CAPPA=.4187	0021500
ELOG=9.793	0021600
PRED=CAPPA*CAPPA/(C2-C1)/(CMU*.5)	0021700
PRTE=1.0	0021800
C-----BOUNDARY VALUES	0021900
UIN=30.	0022000
ULARGE=UIN*(RSMALL/RLARGE)**2	0022100
TURBIN=.03	0022200
TEIN=TURBIN*UIN**2	0022300
ALAMDA=0.005	0022400
EDIN=TEIN**1.5/(ALAMDA*RLARGE)	0022500
VISCOS=1.8E-5	0022600
C-----PRESSURE CALCULATION	0022700
IPREF=2	0022800
JPREF=2	0022900
C-----PROGRAM CONTROL AND MONITOR	0023000
IMON=NIM1	0023100
JMON=8	0023200
SORMAX=.004	0023300
C	0023400
CHAPTER 2 2 2 2 2 2 INITIAL OPERATIONS 2 2 2 2 2 2 2 2	0023500
CALL INIT	0023600
C-----NONDIMENSIONALIZE X & Y VARIABLES FOR NONDIMENSIONAL OUTPUT	0023700
DO 50 I=1,NI	0023800
XND(I)=X(I)/(2.*RLARGE)	0023900
50 XUND(I)=XU(I)/(2.*RLARGE)	0024000

DO 60 J=1,NJ	0024100
YND(J)=Y(J)/(2.*RLARGE)	0024200
60 YVND(J)=YV(J)/(2.*RLARGE)	0024300
C-----INITIALISE VARIABLE FIELDS	0024400
FLOWIN=0.0	0024500
ARDEN=0.0	0024600
ARDENT=0.	0024700
XMONIN=0.	0024800
WMONIN=0.0	0024900
ANGMOM=0.	0025000
C	0025100
C-----INLET SWIRL VELOCITY PROFILE	0025200
C	0025300
C-----W, USE SOLID BODY ROTATION MODEL	0025400
WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*UIN	0025500
DO 206 J=2,JSTEP	0025600
206 W(1,J)=WINST*R(J)/R(JSTEP)	0025700
C-----NSBR=0 - FLAT SWIRL VELOCITY PROFILE FROM SWIRL VANES	0025800
C-----NSBR=1 - SOLID BODY ROTATION FROM SWIRL GENERATOR	0025900
IF(NSBR.EQ. 1) GO TO 208	0026000
C-----W, FLAT PROFILE	0026100
WIN=UIN*TAN(VANB(LFS)*3.14159/180.)	0026200
DO 207 J=2,JSTEP	0026300
207 W(1,J)=WIN	0026400
208 CONTINUE	0026500
C-----INITIALIZE U-,TE-,ED-, & W-FIELDS	0026600
DO 200 J=2,JSTEP	0026700
U(2,J)=UIN	0026800
TE(1,J)=TEIN	0026900
ED(1,J)=EDIN	0027000
ARDEN=0.5*(DEN(1,J)+DEN(2,J))*RCV(J)*SNS(J)	0027100
XMONIN=XMONIN+ARDEN*U(2,J)*U(2,J)	0027200
WMONIN=WMONIN+ARDEN*U(2,J)*W(1,J)	0027300
ANGMOM=ANGMOM+ARDEN*U(2,J)*W(1,J)*R(J)	0027400
ARDENT=ARDENT+ARDEN	0027500
200 FLOWIN=FLOWIN+ARDEN*U(2,J)	0027600
UMEAN=FLOWIN/ARDENT	0027700
SWRLNO=ANGMOM/(XMONIN*RSMALL)	0027800
IF(W(1,JSTEP).EQ. 0.) WMONIN=1.	0027900
DO 202 I=2,NI	0028000
IJ=JMAXP1(I-1)	0028100
FACTOR=(YV(JSTEP1)*RV(JSTEP1))/(YV(IJ)*RV(IJ))	0028200
JJ=JMAX(I-1)	0028300
DO 202 J=2,JJ	0028400
U(I,J)=UIN*FACTOR	0028500
202 CONTINUE	0028600
C	0028700
IF(NSBR.EQ. 0) GO TO 219	0028800
DO 209 I=2,NI	0028900
JJ=JMAX(I)	0029000
DO 209 J=2,JJ	0029100
WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*U(I,2)	0029200
W(I,J)=WINST*R(J)/R(JJ)	0029300
TE(I,J)=TEIN	0029400
ED(I,J)=EDIN	0029500
209 CONTINUE	0029600
GO TO 221	0029700
C	0029800
219 CONTINUE	0029900
DO 220 I=2,NI	0030000

	JJ=JMAX(I)	0030100
	DO 220 J=2,JJ	0030200
	TE(I,J)=TEIN	0030300
	ED(I,J)=EDIN	0030400
220	CONTINUE	0030500
C		0030600
221	CONTINUE	0030700
	DO 203 I=2,NIM1	0030800
203	YPLUSN(I)=11.0	0030900
	DO 204 J=JSTEP,NJ	0031000
	XPLUSW(J)=11.0	0031100
204	IF(J.EQ.JSTEP) XPLUSW(J)= 0.0	0031200
	URFVIS=.7	0031300
	CALL PROPS	0031400
C-----	INITIAL OUTPUT	0031500
	WRITE(6,211)	0031600
	IK=JMAXP1(ISTEP)	0031700
	YSLOPE=YV(IK)-YV(JSTP1)	0031800
	IF(JMAX(ISTEP) .LT. NJM1) ALPHA=ATAN(YSLOPE/SEWU(2))*180./3.14159	0031900
	IF((JSTEP .LT. NJM1) .AND. (JMAX(ISTEP) .EQ. NJM1)) ALPHA=90.	0032000
	WRITE(6,225) ALPHA	0032100
	WRITE(6,235) RSMALL	0032200
	WRITE(6,240) RLARGE	0032300
	WRITE(6,245) ALTOT	0032400
	RE=UIN*RSMALL*2.0*DENSIT/VISCOS	0032500
	WRITE(6,250) RE	0032600
	WRITE(6,255) VISCOS	0032700
	RSDRL=RSMALL/RLARGE	0032800
	WRITE(6,260) DENSIT	0032900
295	CONTINUE	0033000
	IF(.NOT. IWRITE) GO TO 297	0033100
	WRITE(11) X	0033200
	WRITE(11) Y	0033300
	WRITE(14) XUND	0033400
297	CONTINUE	0033500
	IF(.NOT. IREAD) GO TO 298	0033600
	READ(12) U	0033700
	READ(12) V	0033800
	READ(12) W	0033900
	READ(12) P	0034000
	READ(12) TE	0034100
	READ(12) ED	0034200
	READ(12) VIS	0034300
	READ(12) STFN	0034400
298	CONTINUE	0034500
	IF(.NOT. INITAL) GO TO 299	0034600
	IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)	0034700
	IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)	0034800
	IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,W,HEDW)	0034900
	IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,TE,HEDK)	0035000
	IF(INCald) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)	0035100
299	CONTINUE	0035200
	RESORU=.005	0035300
	URFP=1.	0035400
	RESORV=.005	0035500
	RESORW=.005	0035600
C		0035700
CHAPTER	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0035800
C		0035900
	WRITE(6,310) IMON,JMON	0036000

300 NITER=NITER+1	0036100
DO 330 I=2,NIM1	0036200
DO 330 J=2,NJM1	0036300
330 PP(I,J)=0.	0036400
IF(LFS .GE. 3) GO TO 425	0036500
URFU=.5	0036600
URFV=.5	0036700
URFW=.6	0036800
URFK=.7	0036900
URFE=.7	0037000
URFVIS=.7	0037100
IF(LFS .LT. 3) GO TO 430	0037200
425 CONTINUE	0037300
C-----INCREASE UNDERRELAXATION FACTORS AS CONVERGENCE NEARS	0037400
URFU=.15+(FLOAT(NITER))*((.35-.15)/40.)	0037500
IF(URFU .GT. .35) URFU=.35	0037600
URFV=.20+(FLOAT(NITER))*((.25-.20)/40.)	0037700
IF(URFV .GT. .25) URFV=.25	0037800
URFW=.50+(FLOAT(NITER))*((.60-.50)/40.)	0037900
IF(URFW .GT. .60) URFW=.60	0038000
URFK=.70	0038100
URFE=.70	0038200
URFVIS=.70	0038300
IF((RESORV .LT. .08) .AND. (RESORU .LT. .10)) URFU=.40	0038400
IF((RESORV .LT. .06) .AND. (RESORU .LT. .08)) URFU=.45	0038500
IF((RESORK .LT. .10E-1) .AND. (RESORE .LT. .10E+10)) URFE=.75	0038600
IF((RESORK .LT. .4E-2) .AND. (RESORE .LT. .5E+9)) URFE=.80	0038700
IF(RESORU .LT. SORMAX) URFU=.20	0038800
IF(RESORV .LT. SORMAX) URFV=.20	0038900
IF(RESORW .LT. SORMAX) URFW=.25	0039000
IF(RESORK .LT. .10E-2) URFK=.60	0039100
IF(RESORE .LT. .10E+8) URFE=.55	0039200
430 CONTINUE	0039300
C-----UPDATE MAIN DEPENDENT VARIABLES	0039400
IF(INCALU) CALL CALCU	0039500
IF(INCALV) CALL CALCV	0039600
IF(INCALP) CALL CALCP	0039700
IF(INCALW) CALL CALCW	0039800
IF(INCALK) CALL CALCTE	0039900
IF(INCald) CALL CALCED	0040000
C-----UPDATE FLUID PROPERTIES	0040100
IF(INPRO) CALL PROPS	0040200
C-----INTERMEDIATE OUTPUT	0040300
RESORM=RESORM/FLOWIN	0040400
RESORU=RESORU/XMONIN	0040500
RESORV=RESORV/XMONIN	0040600
RESORW=RESORW/WMONIN	0040700
RESORK=RESORK/(.5*FLOWIN*UMEAN*UMEAN)	0040800
IF(NITER .NE. IPRINT) GO TO 301	0040900
IPRINT=IPRINT+1	0041000
WRITE(6,311) NITER,RESORU,RESORV,RESORW,RESORM,RESORK,	0041100
*RESORE,U(IMON,JMON),V(IMON,JMON),W(IMON,JMON),P(IMON,NJM1),	0041200
*ED(IMON,NJM1)	0041300
IF(NITER .NE. JPRINT) GO TO 301	0041400
IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)	0041500
IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)	0041600
IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,W,HEDW)	0041700
IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,P,HEDP)	0041800
IF(INCald) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)	0041900
JPRINT=JPRINT+25	0042000

	WRITE(6,310) IMON,JMON	0042100
301	CONTINUE	0042200
C-----	TERMINATION TESTS	0042300
	SORCE=AMAX1(RESORM,RESORU,RESORV,RESORW,RESORK)	0042400
	IF(NITER.GE.MAXIT) GO TO 302	0042500
303	IF(NITER .GE. 150 .AND. SORCE .GE. 3.0) GO TO 302	0042600
	IF(SORCE.GT.SORMAX .OR. NITER .LT. 20) GO TO 300	0042700
302	CONTINUE	0042800
	IF(NITER .GE. 150 .AND. SORCE .GE. 3.0) WRITE(6,960)	0042900
C		0043000
C	CHAPTER 4 4 4 4 4 4 FINAL OPERATIONS AND OUTPUT 4 4 4 4 4 4	0043100
		0043200
440	CONTINUE	0043300
C-----	NONDIMENSIONALIZE PROBLEM SOLN.	0043400
	IF(.NOT. NONDIM) GO TO 700	0043500
	DO 600 I=1,NI	0043600
	DO 600 J=1,NJ	0043700
	USTAR(I,J)=U(I,J)/UIN	0043800
	VSTAR(I,J)=V(I,J)/UIN	0043900
	WSTAR(I,J)=W(I,J)/UIN	0044000
	PSTAR(I,J)=P(I,J)/(DENSIT*(UIN**2)/2.)	0044100
	TESTAR(I,J)=TE(I,J)/(UIN*UIN)	0044200
	SP(I,J)=0.0	0044300
	IF(ED(I,J) .GT. 1.E-15) SP(I,J)=TE(I,J)**1.5/ED(I,J)/RLARGE	0044400
	VISTAR(I,J)=VIS(I,J)/VISCOS	0044500
600	CONTINUE	0044600
700	CONTINUE	0044700
	IF(INCALS) CALL STRMFN	0044800
	WRITE(6,312)	0044900
	WRITE(6,410) LFS,NSBR,SWNB(LFS),VANB(LFS),SWRLNO,UMEAN,FLOWIN	0045000
	IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)	0045100
	IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)	0045200
	IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,W,HEDW)	0045300
	IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,P,HEDP)	0045400
	IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,PP,HEDP)	0045500
	IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,TE,HEDK)	0045600
	IF(INCALD) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)	0045700
	IF(INCALS) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,STFN,HEDSF)	0045800
	IF(INCALS) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,STVAL,YSTLN,HEDSL)	0045900
	IF(.NOT. NONDIM) GO TO 750	0046000
	IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XUND,YND,USTAR,HEDDU)	0046100
	IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YVND,VSTAR,HEDDV)	0046200
	IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,WSTAR,HEDDW)	0046300
	IF(INCALS) CALL PRINT(1,1,NI,NJ,IT,JT,XUND,STVAL,YSTLND,HEDDSL)	0046400
	IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,PSTAR,HEDDP)	0046500
	IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,TESTAR,HEDDK)	0046600
	IF(INCALK) CALL PRINT(2,2,NI,NJ,IT,JT,X,Y,SP,HEDL)	0046700
	IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,VISTAR,HEDDVS)	0046800
750	CONTINUE	0046900
	IF(.NOT. IWRITE) GO TO 702	0047000
	WRITE(11) U	0047100
	WRITE(11) V	0047200
	WRITE(11) W	0047300
	WRITE(11) P	0047400
	WRITE(11) TE	0047500
	WRITE(11) ED	0047600
	WRITE(11) VIS	0047700
	WRITE(11) STFN	0047800
	WRITE(14) YSTLND	0047900
702	CONTINUE	0048000

C-----CALCULATION OF SHEAR-STRESS COEFFICIENT ALONG LARGE DUCT WALL	0048100
WRITE(6,402)	0048200
DO 401 I=2,NIM1	0048300
SSC=ABS(TAUN(I))/(.5*DENSIT*UIN*UIN)	0048400
WRITE(6,403) I,XND(I),SSC	0048500
401 CONTINUE	0048600
WRITE(6,312)	0048700
C-----PLOT DIMENSIONLESS STREAMLINES	0048800
LARGE=0	0048900
IF(INPLOT .AND. INCALS) CALL PLOT (XUDPLT,IT,NPTS,XAXIS,YSLPLT,	0049000
#MAXLN,NPLTLN,YAXES,SYMB L,LARGE)	0049100
LARGE=1	0049200
IF(INPLOT .AND. INCALS) CALL PLOT (XUDPLT,IT,NPTS,XAXIS,YSLPLT,	0049300
#MAXLN,NPLTLN,YAXES,SYMB L,LARGE)	0049400
C-----RESET INITIAL CONDITIONS FOR ANOTHER SWIRL CASE	0049500
IF(LFS .GE. LFSMAX) GO TO 409	0049600
LFS=LFS+1	0049700
NITER=0	0049800
JPRINT=NITER+300	0049900
IPRINT=NITER+1	0050000
304 IF(LFS .GE. 3) MAXIT=NITER+200	0050100
IF(NSBR .EQ. 0) GO TO 405	0050200
WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*UIN	0050300
DO 406 J=2,JSTEP	0050400
406 W(1,J)=WINST*R(J)/R(JSTEP)	0050500
GO TO 408	0050600
405 WIN=UIN*TAN(VANB(LFS)*3.14159/180.)	0050700
DO 407 J=2,JSTEP	0050800
407 W(1,J)=WIN	0050900
408 FLOWIN=0.	0051000
ARDEN=0.	0051100
ARDENT=0.	0051200
XMONIN=0.	0051300
ANGMOM=0.	0051400
WMONIN=0.	0051500
C-----READ INITIAL GUESS OF NEXT SWIRL PROBLEM FROM	0051600
C-----PREVIOUS SOLN. OF SIMILAR PROBLEM	0051700
IF(.NOT. IREAD) GO TO 445	0051800
READ(12) U	0051900
READ(12) V	0052000
READ(12) W	0052100
READ(12) P	0052200
READ(12) TE	0052300
READ(12) ED	0052400
READ(12) VIS	0052500
READ(12) STFN	0052600
445 CONTINUE	0052700
DO 490 J=2,JSTEP	0052800
ARDEN=0.5*(DEN(1,J)+DEN(2,J))*RCV(J)*SNS(J)	0052900
XMONIN=XMONIN+ARDEN*U(2,J)*U(2,J)	0053000
WMONIN=WMONIN+ARDEN*U(2,J)*W(1,J)	0053100
ANGMOM=ANGMOM+ARDEN*U(2,J)*W(1,J)*R(J)	0053200
ARDENT=ARDENT+ARDEN	0053300
490 FLOWIN=FLOWIN+ARDEN*U(2,J)	0053400
UMEAN=FLOWIN/ARDENT	0053500
SWRLNO=ANGMOM/(XMONIN*RSMALL)	0053600
IF(W(1,JSTEP) .EQ. 0.) WMONIN=1.	0053700
WRITE(6,310) IMON,JMON	0053800
GO TO 300	0053900
409 CONTINUE	0054000


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      STOP
C-----FORMAT STATEMENTS
211 FORMAT(1H1,T37,'AXISYMMETRIC,ISOTHERMAL, GT COMBUSTOR FLOWFIELD SI
      #MULATION',//,T35,'USING THE STAIRSTEP APPROXIMATION FOR THE SLOPIN
      #G EXPANSION WALL',//,T53,'AND THE K-E TURBULENCE MODEL')
225 FORMAT(////,T40,'EXPANSION ANGLE(DEG.) =' ,T77,1PE13.3)
230 FORMAT(//,T40,'NUMBER OF STAIRSTEPS =' ,T81,I1)
235 FORMAT (//,T40,'INLET RADIUS(M) =' ,T77,1PE13.3)
240 FORMAT(//,T40,'COMBUSTOR RADIUS(M) =' ,T77,1PE13.3)
245 FORMAT(//,T40,'COMBUSTOR LENGTH(M) =' ,T77,1PE13.3)
250 FORMAT(//,T40,'INLET REYNOLDS NO.(USING DIAM.) =' ,T77,1PE13.3)
255 FORMAT(//,T40,'LAMINAR VISCOSITY(KG/M/SEC) =' ,T77,1PE13.3)
260 FORMAT(//,T40,'DENSITY(KG/CU. M) =' ,T77,1PE13.3,////)
310 FORMAT(13H0ITER I---, 9X,29HABSOLUTE RESIDUAL SOURCE SUMS,9X,
      11H---I I---,37H FIELD VALUES AT MONITORING LOCATION(I2,1H,,I2,
      *6H) ---I/14H NO UMON,7X,'VMON',7X,'WMON',7X,'MASS',7X,
      *'TKIN'
      3,7X,4HDISP,9X,1HU,9X,1HV,10X,1HW,10X,1HP,10X,1HD/)
311 FORMAT (2X,I4,11E11.4)
312 FORMAT (1H0,59(2H- ))
402 FORMAT(//9X,1H1,5X,3HX/D,5X,10HS.S.COEFF.)
403 FORMAT(/5X,I5,2(1PE11.3))
410 FORMAT(/23H SWIRL CASE WITH LFS =,I3/
      1 23H AND NSBR =,I3//
      163H CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER =
      1,F10.3//37H OR IF NSBR = 0 TO SWIRL VANE ANGLE =,F10.3//,
      11X,' COMPUTED INLET SWIRL NUMBER =' ,F10.4//,
      11X,' COMPUTED INLET MEAN AXIAL VELOCITY =' ,F10.4//,
      11X,' COMPUTED INLET MASS FLOW RATE =' ,F10.5/////
950 FORMAT(10X,6F10.5,/,10X,6F10.5,/,10X,4F10.5)
960 FORMAT(15X,' THE SOLN. IS NOT CONVERGING')
      END
C
C-----
C
C
SUBROUTINE INIT
CA*****
C
CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0
C
COMMON
1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)
1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSPV(24),SNSV(24)
*/WVEL/ RESORW, NSWPW, URFW
1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF
*/VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),
*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),
*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)
#,VISTAR(48,24)
1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)
1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYP5(24),
# SHS(24),SEW(48),XU(48),YV(24),R(24),RV(24),
1 WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),
#YND(24),YVND(24)
COMMON
1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)
1/KASE T1/UIIN,TEIN,EDIN,FLOWIN,ALAMDA,
2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1
1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE
1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)

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	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0060100
	1 SP(48,24)	0060200
	1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT	0060300
C		0060400
CHAPTER	1 1 1 1 1 CALCULATE GEOMETRICAL QUANTITIES 1 1 1 1 1	0060500
C		0060600
	DO 100 J=1,NJ	0060700
	R(J)=Y(J)	0060800
100	IF(INDCOS.EQ.1)R(J)=1.0	0060900
	DXPW(1)=0.0	0061000
	DXEP(NI)=0.0	0061100
	DO 101 I=1,NIM1	0061200
	DXEP(I)=X(I+1)-X(I)	0061300
101	DXPW(I+1)=DXEP(I)	0061400
	DYPS(1)=0.0	0061500
	DYNP(NJ)=0.0	0061600
	DO 102 J=1,NJM1	0061700
	DYNP(J)=Y(J+1)-Y(J)	0061800
102	DYPS(J+1)=DYNP(J)	0061900
	SEW(1)=0.0	0062000
	SEW(NI)=0.0	0062100
	DO 103 I=2,NIM1	0062200
103	SEW(I)=0.5*(DXEP(I)+DXPW(I))	0062300
	SNS(1)=0.0	0062400
	SNS(NJ)=0.0	0062500
	DO 104 J=2,NJM1	0062600
104	SNS(J)=0.5*(DYNP(J)+DYPS(J))	0062700
	XU(1)=0.0	0062800
	DO 105 I=2,NI	0062900
105	XU(I)=0.5*(X(I)+X(I-1))	0063000
	DXPWU(1)=0.0	0063100
	DXPWU(2)=0.0	0063200
	DXEPU(1)=0.0	0063300
	DXEPU(NI)=0.0	0063400
	DO 106 I=2,NIM1	0063500
	DXEPU(I)=XU(I+1)-XU(I)	0063600
106	DXPWU(I+1)=DXEPU(I)	0063700
	SEWU(1)=0.0	0063800
	DO 107 I=2,NI	0063900
107	SEWU(I)=X(I)-X(I-1)	0064000
C-----	U-VELOCITIES WEIGHTING FACTORS	0064100
	DO 111 I=2,NIM1	0064200
	WFE(I)=SEWU(I+1)/(SEWU(I+1)+SEWU(I))	0064300
	IF(I.LE.2) GO TO 111	0064400
	WFW(I)=SEWU(I-1)/(SEWU(I-1)+SEWU(I))	0064500
111	CONTINUE	0064600
	YV(1)=0.0	0064700
	RV(1)=0.0	0064800
	DO 108 J=2,NJ	0064900
	RV(J)=0.5*(R(J)+R(J-1))	0065000
108	YV(J)=0.5*(Y(J)+Y(J-1))	0065100
	RCV(1)=R(1)	0065200
	RCV(NJ)=R(NJ)	0065300
	DO 113 J=2,NJM1	0065400
113	RCV(J)=0.5*(RV(J+1)+RV(J))	0065500
	DYPSV(1)=0.0	0065600
	DYPSV(2)=0.0	0065700
	DYNPV(NJ)=0.0	0065800
	DO 109 J=2,NJM1	0065900
	DYNPV(J)=YV(J+1)-YV(J)	0066000

109	DYPSV(J+1)=DYNPV(J)	0066100
	SNSV(1)=0.0	0066200
	DO 110 J=2,NJ	0066300
110	SNSV(J)=Y(J)-Y(J-1)	0066400
C-----	V-VELOCITIES WEIGHTING FACTORS	0066500
	DO 112 J=3,NJM1	0066600
	WFN(J)=SNSV(J+1)/(SNSV(J+1)+SNSV(J))	0066700
	WFS(J)=SNSV(J-1)/(SNSV(J-1)+SNSV(J))	0066800
112	CONTINUE	0066900
C		0067000
CHAPTER	2 2 2 2 2 2 SET VARIABLES TO ZERO 2 2 2 2 2 2	0067100
C		0067200
	DO 200 I=1,NI	0067300
	TAUN(I)=1.0	0067400
	DO 200 J=1,NJ	0067500
	TAUW(J)=1.0	0067600
	U(I,J)=0.0	0067700
	V(I,J)=0.0	0067800
	W(I,J)=0.0	0067900
	P(I,J)=0.0	0068000
	PP(I,J)=0.0	0068100
	TE(I,J)=0.0	0068200
	ED(I,J)=0.0	0068300
	DEN(I,J)=DENSIT	0068400
	VIS(I,J)=VISCOS	0068500
	DU(I,J)=0.0	0068600
	DV(I,J)=0.0	0068700
	SU(I,J)=0.0	0068800
	SP(I,J)=0.0	0068900
	STFN(I,J)=0.0	0069000
200	CONTINUE	0069100
	DO 300 I=1,NI	0069200
	DO 300 J=1,NSTLN	0069300
	YSTLN(I,J)=0.0	0069400
	YSTLND(I,J)=0.0	0069500
	STVAL(J)=0.0	0069600
300	CONTINUE	0069700
	DO 400 N=1,NPLTLN	0069800
	DO 400 I=1,NI	0069900
	YSLPLT(N,I)=0.0	0070000
400	CONTINUE	0070100
	RETURN	0070200
	END	0070300
C		0070400
C-----		0070500
C		0070600
	SUBROUTINE PROPS	0070700
CA*****		0070800
C		0070900
CHAPTER	0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0	0071000
C		0071100
	COMMON	0071200
	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0071300
	*VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0071400
	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0071500
	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0071600
	#,VISTAR(48,24)	0071700
	1/ALL/IT, JT, NI, NJ, NIM1, NJM1, GREAT, JMAX(48), JMAXP1(48)	0071800
	1/TURB/GEN(48,24), CD, CMU, C1, C2, CAPPA, ELOG, PRED, PRTE	0071900
C		0072000


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CHAPTER 1 1 1 VISCOSITY 1 1 1 0072100
C 0072200
DO 100 I=2,NIM1 0072300
DO 100 J=2,NJM1 0072400
VISOLD=VIS(I,J) 0072500
IF(ED(I,J).EQ.0.) GO TO 102 0072600
VIS(I,J)=DEN(I,J)*TE(I,J)**2*CMU/ED(I,J)+VISCOS 0072700
GO TO 101 0072800
102 VIS(I,J)=VISCOS 0072900
C-----UNDER-RELAX VISCOSITY 0073000
101 VIS(I,J)=URFVIS*VIS(I,J)+(1.-URFVIS)*VISOLD 0073100
100 CONTINUE 0073200
RETURN 0073300
END 0073400
C 0073500
C----- 0073600
C 0073700
SUBROUTINE CALCU 0073800
CA***** 0073900
C 0074000
CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0074100
C 0074200
COMMON 0074300
1/VEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48) 0074400
1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24) 0074500
1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF 0074600
*/VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0074700
*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24), 0074800
*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0074900
#,VISTAR(48,24) 0075000
1/ALL/IT, JT, NI, NJ, NIM1, NJM1, GREAT, JMAX(48), JMAXP1(48) 0075100
1/GEOM/INDCOS, X(48), Y(24), DXEP(48), DXPW(48), DYNP(24), DYPS(24), 0075200
1 SNS(24), SEW(48), XU(48), YV(24), R(24), RV(24), 0075300
# WFN(24), WFS(24), WFE(48), WFW(48), RCV(24), XND(48), XUND(48), 0075400
#YND(24), YVHD(24) 0075500
COMMON 0075600
1/FLUPR/URFVIS, VISCOS, DENSIT, PRANDT, DEN(48,24), VIS(48,24) 0075700
1/COEF/AP(48,24), AN(48,24), AS(48,24), AE(48,24), AW(48,24), SU(48,24), 0075800
1 SP(48,24) 0075900
1/KASE T1/UIN, TEIN, EDIN, FLOWIN, ALAMDA, 0076000
2 RSMALL, RLARGE, AL1, AL2, JSTEP, ISTEP, JSTP1, JSTM1, ISTP1, ISTM1 0076100
C 0076200
CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1 0076300
C 0076400
DO 100 I=3,NIM1 0076500
DO 101 J=2,NJM1 0076600
C-----COMPUTE AREAS AND VOLUME 0076700
AREAN=RV(J+1)*SEWU(I) 0076800
AREAS=RV(J)*SEWU(I) 0076900
AREAEW=RCV(J)*SNS(J) 0077000
VOL=RCV(J)*SEWU(I)*SNS(J) 0077100
C-----CALCULATE CONVECTION COEFFICIENTS 0077200
GN=0.5*(DEN(I,J+1)+DEN(I,J))*V(I,J+1) 0077300
GNW=0.5*(DEN(I-1,J)+DEN(I-1,J+1))*V(I-1,J+1) 0077400
GS=0.5*(DEN(I,J-1)+DEN(I,J))*V(I,J) 0077500
GSW=0.5*(DEN(I-1,J)+DEN(I-1,J-1))*V(I-1,J) 0077600
GE=DEN(I,J)*(U(I+1,J)*(1.0-WFE(I))+U(I,J)*WFE(I)) 0077700
GW=DEN(I-1,J)*(U(I-1,J)*(1.0-WFW(I))+U(I,J)*WFW(I)) 0077800
CN=0.5*(GN+GNW)*AREAN 0077900
CS=0.5*(GS+GSW)*AREAS 0078000

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CE=GE*AREA EW                                0078100
CW=GW*AREA EW                                0078200
C-----CALCULATE DIFFUSION COEFFICIENTS      0078300
VISH=0.25*(VIS(I,J)+VIS(I,J+1)+VIS(I-1,J)+VIS(I-1,J+1)) 0078400
VISS=0.25*(VIS(I,J)+VIS(I,J-1)+VIS(I-1,J)+VIS(I-1,J-1)) 0078500
DN=VISH*AREAN/DYNP(J)                        0078600
DS=VISS*AREAS/DYPS(J)                        0078700
DE=VIS(I,J)*AREA EW/DXEP(U(I))                0078800
DW=VIS(I-1,J)*AREA EW/DXPW(U(I))              0078900
C-----CALCULATE COEFFICIENTS OF SOURCE TERMS 0079000
SMP=CN-CS+CE-CW                               0079100
CP=AMAX1(0.0,SMP)                             0079200
CPO=CP                                          0079300
C-----ASSEMBLE MAIN COEFFICIENTS            0079400
AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN          0079500
AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS          0079600
DE=AMAX1(DE,-WFE(I))*CE,(1.0-WFE(I))*CE)      0079700
DW=AMAX1(DW,WFW(I))*CW,-(1.0-WFW(I))*CW)      0079800
AE(I,J)=DE-(1.0-WFE(I))*CE                    0079900
AW(I,J)=DW+(1.0-WFW(I))*CW                    0080000
DU(I,J)=AREA EW                               0080100
DUDXE=(U(I+1,J)-U(I,J))/DXEP(U(I))            0080200
DUDXW=(U(I,J)-U(I-1,J))/DXPW(U(I))            0080300
SORCE1=(DUDXE*VIS(I,J)-DUDXW*VIS(I-1,J))/SEW(U(I)) 0080400
DVDXN=(V(I,J+1)-V(I-1,J+1))/SEW(U(I))         0080500
DVDXS=(V(I,J)-V(I-1,J))/SEW(U(I))             0080600
SORCE2=(RV(J+1)*VISH*DVDXN-RV(J)*VISS*DVDXS)/(RCV(J)*DYNPV(J)) 0080700
SU(I,J)=CPO*U(I,J)+DU(I,J)*(P(I-1,J)-P(I,J))  0080800
SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL           0080900
SP(I,J)=-CP                                    0081000
101 CONTINUE                                  0081100
100 CONTINUE                                  0081200
C                                              0081300
CHAPTER 2 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 0081400
C                                              0081500
CALL PROMOD (2)                               0081600
C                                              0081700
CHAPTER 3 FINAL COEFF. ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3 3 0081800
C                                              0081900
RESORU=0.0                                     0082000
DO 300 I=3,NIM1                               0082100
DO 301 J=2,NJM1                               0082200
AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J) 0082300
DU(I,J)=DU(I,J)/AP(I,J)                       0082400
RESOR=AN(I,J)*U(I,J+1)+AS(I,J)*U(I,J-1)+AE(I,J)*U(I+1,J) 0082500
1 +AW(I,J)*U(I-1,J)-AP(I,J)*U(I,J)+SU(I,J)    0082600
VOL=RCV(J)*SEW(U(I))*SNS(J)                   0082700
SORVOL=GREAT*VOL                              0082800
IF(-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL 0082900
RESORU=RESORU+ABS(RESOR)                       0083000
C-----UNDER-RELAXATION                      0083100
AP(I,J)=AP(I,J)/URFU                           0083200
SU(I,J)=SU(I,J)+(1.-URFU)*AP(I,J)*U(I,J)      0083300
DU(I,J)=DU(I,J)*URFU                           0083400
301 CONTINUE                                  0083500
300 CONTINUE                                  0083600
C                                              0083700
CHAPTER 4 4 4 SOLUTION OF DIFFERENCE EQUATION 4 4 4 4 4 4 0083800
C                                              0083900
DO 400 N=1,NSWPU                              0084000

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400 CALL LISOLV(3,2,NI,JMAX,IT,JT,U,2)
      RETURN
      END
C-----
C
C
      SUBROUTINE CALCV
CA*****
C
CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0
C
      COMMON
1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)
1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)
1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF
*/VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),
*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),
*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)
#,VISTAR(48,24)
1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)
1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),
1 SNS(24),SEN(48),XU(48),YV(24),R(24),RV(24),
# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),
#YND(24),YVND(24)
      COMMON
1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)
1/COEF/AP(48,24),ANC(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),
1 SP(48,24)
1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,
2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1
C
CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1 1
C
      DO 100 I=2,NIM1
      DO 101 J=3,NJM1
C-----COMPUTE AREAS AND VOLUME
      AREAN=R(J)*SEW(I)
      AREAS=R(J-1)*SEW(I)
      AREAEW=RV(J)*SNSV(J)
      VOL=RV(J)*SEW(I)*SNSV(J)
C-----CALCULATE CONVECTION COEFFICIENTS
      GN=DEN(I,J)*(V(I,J+1)*(1.0-WFN(J))+V(I,J)*WFN(J))
      GS=DEN(I,J-1)*(V(I,J-1)*(1.0-WFS(J))+V(I,J)*WFS(J))
      GE=0.5*(DEN(I+1,J)+DEN(I,J))*U(I+1,J)
      GSE=0.5*(DEN(I,J-1)+DEN(I+1,J-1))*U(I+1,J-1)
      GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)
      GSW=0.5*(DEN(I,J-1)+DEN(I-1,J-1))*U(I,J-1)
      CN=GN*AREAN
      CS=GS*AREAS
      CE=0.5*(GE+GSE)*AREAEW
      CW=0.5*(GW+GSW)*AREAEW
C-----CALCULATE DIFFUSION COEFFICIENTS
      VISE=0.25*(VIS(I,J)+VIS(I+1,J)+VIS(I,J-1)+VIS(I+1,J-1))
      VISW=0.25*(VIS(I,J)+VIS(I-1,J)+VIS(I,J-1)+VIS(I-1,J-1))
      DN=VIS(I,J)*AREAN/DYNPV(J)
      DS=VIS(I,J-1)*AREAS/DYPSV(J)
      DE=VISE*AREAEW/DXEP(I)
      DW=VISW*AREAEW/DXPW(I)
C-----CALCULATE COEFFICIENTS OF SOURCE TERMS
      SMP=CN-CS+CE-CW

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CP=AMAX1(0.0,SMP)                                0090100
CPO=CP                                              0090200
C-----ASSEMBLE MAIN COEFFICIENTS                0090300
DN=AMAX1(DN,-WFN(J)*CN,(1.0-WFN(J))*CN)           0090400
DS=AMAX1(DS,WFS(J)*CS,-(1.0-WFS(J))*CS)           0090500
AN(I,J)=DN-(1.0-WFN(J))*CN                        0090600
AS(I,J)=DS+(1.0-WFS(J))*CS                        0090700
AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE              0090800
AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW              0090900
DV(I,J)=0.5*(AREAN+AREAS)                         0091000
DUDYE=(U(I+1,J)-U(I+1,J-1))/SNSV(J)              0091100
DUDYW=(U(I,J)-U(I,J-1))/SNSV(J)                  0091200
SORCE1=(DUDYE*VISE-DUDYW*VISW)/DXEPU(I)           0091300
DVDYN=(V(I,J+1)-V(I,J))/DYNPV(J)                 0091400
DVDYS=(V(I,J)-V(I,J-1))/DYPSV(J)                 0091500
SORCE2=(VIS(I,J)*RCV(J)*DVDYN-VIS(I,J-1)*RCV(J-1)*DVDYS) 0091600
# / (RV(J)*SNSV(J))                               0091700
SU(I,J)=CPO*V(I,J)+DV(I,J)*(P(I,J-1)-P(I,J))      0091800
SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL               0091900
SP(I,J)=-CP                                         0092000
IF(INDCOS.EQ.1) GO TO 101                         0092100
SU(I,J)=SU(I,J)+VOL*((DEN(I,J)+DEN(I,J-1))*(W(I,J)+W(I,J-1) 0092200
#)*2)/(8.*RV(J))                                  0092300
SP(I,J)=SP(I,J)-(VIS(I,J)+VIS(I,J-1))*VOL/RV(J)*2 0092400
101 CONTINUE                                       0092500
100 CONTINUE                                       0092600
C                                                    0092700
CHAPTER 2 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 0092800
C                                                    0092900
CALL PROMOD (3)                                    0093000
C                                                    0093100
CHAPTER 3 FINAL COEFF. ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3 3 0093200
C                                                    0093300
RESORV=0.0                                         0093400
DO 300 I=2,NIM1                                    0093500
DO 301 J=3,NJM1                                    0093600
AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)  0093700
DV(I,J)=DV(I,J)/AP(I,J)                          0093800
RESOR=AN(I,J)*V(I,J+1)+AS(I,J)*V(I,J-1)+AE(I,J)*V(I+1,J) 0093900
1 +AW(I,J)*V(I-1,J)-AP(I,J)*V(I,J)+SU(I,J)       0094000
VOL=RV(J)*SEW(I)*SNSV(J)                         0094100
SORVOL=GREAT*VOL                                  0094200
IF(-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL    0094300
RESORV=RESORV+ABS(RESOR)                          0094400
C-----UNDER-RELAXATION                          0094500
AP(I,J)=AP(I,J)/URFV                              0094600
SU(I,J)=SU(I,J)+(1.-URFV)*AP(I,J)*V(I,J)         0094700
DV(I,J)=DV(I,J)*URFV                              0094800
301 CONTINUE                                       0094900
300 CONTINUE                                       0095000
C                                                    0095100
CHAPTER 4 4 4 SOLUTION OF DIFFERENCE EQUATION 4 4 4 4 4 4 0095200
C                                                    0095300
DO 400 N=1,NSWPV                                  0095400
400 CALL LISOLV(2,3,NI,JMAX,IT,JT,V,3)           0095500
RETURN                                             0095600
END                                                0095700
C                                                    0095800
C-----                                           0095900
C                                                    0096000

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SUBROUTINE CALCW
CA*****
C
CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0
C
COMMON
1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)
1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)
*/WVEL/ RESORW, NSWPW, URFW
1/TEH/RESORK,NSWPK,URFK
1/TDIS/RESORE,NSWPD,URFE
*/VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),
*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),
*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)
#,VISTAR(48,24)
1/ALL/IT, JT, NI, NJ, NIM1, NJM1, GREAT, JMAX(48), JMAXP1(48)
1/GEOM/INDCOS, X(48), Y(24), DXEP(48), DXPW(48), DYNP(24), DYPS(24),
1 SNS(24), SEW(48), XU(48), YV(24), R(24), RV(24),
# WFN(24), WFS(24), WFE(48), WFW(48), RCV(24), XND(48), XUND(48),
#YND(24), YVND(24)
COMMON
1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)
1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,
2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1
1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE
1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)
1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),
1 SP(48,24)
C-----IF NO SWIRL, RETURN TO MAIN
IF(W(1,3) .LE. 0.) GO TO 500
C
CHAPTER 1 1 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1
C
DO 100 I=2, NIM1
DO 101 J=2, NJM1
C
COMPUTE AREAS AND VOLUME
C
AREAN=RV(J+1)*SEW(I)
AREAS=RV(J)*SEW(I)
AREAEW=RCV(J)*SNS(J)
VOL=RCV(J)*SNS(J)*SEW(I)
C
C-----CALCULATE CONVECTION COEFFICIENTS
C
GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)
GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)
GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)
GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)
CN=GN*AREAN
CS=GS*AREAS
CE=GE*AREAEW
CW=GW*AREAEW
C
C-----CALCULATE DIFFUSION COEFFICIENTS
C
VISN=0.5*(VIS(I,J)+VIS(I,J+1))
VISS=0.5*(VIS(I,J)+VIS(I,J-1))
VISE=0.5*(VIS(I,J)+VIS(I+1,J))
VISW=0.5*(VIS(I,J)+VIS(I-1,J))

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DN=VISN*AREAN/DYNP(J)	0102100
DS=VISS*AREAS/DYPS(J)	0102200
DE=VISE*AREAEW/DXEP(I)	0102300
DW=VISW*AREAEW/DXPW(I)	0102400
C	0102500
C-----SOURCE TERMS	0102600
C	0102700
SMP=CN-CS+CE-CW	0102800
CP=AMAX1(0., SMP)	0102900
CP0=CP	0103000
C	0103100
C-----ASSEMBLE MAIN COEFFICIENTS	0103200
C	0103300
AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN	0103400
AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS	0103500
AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE	0103600
AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW	0103700
DV=0.5*(AREAN+AREAS)	0103800
VAVG=0.5*(V(I,J+1)+V(I,J))	0103900
SU(I,J)=CP0*W(I,J)	0104000
IF(INDCOS.EQ. 1) GO TO 101	0104100
SORCE1=-DEN(I,J)*VAVG*W(I,J) /RCV(J)	0104200
SORCE2=-(VISN*RV(J+1)-VISS*RV(J)) *W(I,J)/(DYNPV(J)*	0104300
#RCV(J)*RCV(J))	0104400
SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL	0104500
SP(I,J)=-CP	0104600
101 CONTINUE	0104700
100 CONTINUE	0104800
C	0104900
CHAPTER 2	0105000
C	0105100
CALL PROMOD (8)	0105200
C	0105300
CHAPTER 3 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION	0105400
C	0105500
RESORW=0.	0105600
DO 300 I=2, NIM1	0105700
DO 301 J=2, NJM1	0105800
AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0105900
RESOR=AN(I,J)*W(I,J+1)+AS(I,J)*W(I,J-1)+AE(I,J)*W(I+1,J)	0106000
* +AW(I,J)*W(I-1,J)-AP(I,J)*W(I,J)+SU(I,J)	0106100
VOL=RCV(J)*SNS(J)*SEW(I)	0106200
SORVOL=GREAT*VOL	0106300
IF(-SP(I,J) .GT. 0.5*SORVOL) RESOR=RESOR/SORVOL	0106400
IF(J .LE. 2) RESOR=0.	0106500
RESORW=RESORW+ABS(RESOR)	0106600
C	0106700
C-----UNDER RELAXATION	0106800
C	0106900
AP(I,J)=AP(I,J)/URFW	0107000
SU(I,J)=SU(I,J)+(1.-URFW)*AP(I,J)*W(I,J)	0107100
301 CONTINUE	0107200
300 CONTINUE	0107300
C	0107400
CHAPTER 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4 4 4 4 4 4	0107500
C	0107600
DO 400 N=1, NSWPW	0107700
400 CALL LISOLV(2, 2, NI, JMAX, IT, JT, W,8)	0107800
500 CONTINUE	0107900
RETURN	0108000


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END
C
C-----
C
SUBROUTINE CALCP
CA*****
C
CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0
C
COMMON
1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF
*/VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),
*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),
*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)
#.VISTAR(48,24)
1/ALL/IT, JT, NI, NJ, NIM1, NJM1, GREAT, JMAX(48), JMAXP1(48)
1/GEOM/INDCOS, X(48), Y(24), DXEP(48), DXPW(48), DYNP(24), DYP(24),
1 SNS(24), SEW(48), XU(48), YV(24), R(24), RV(24),
# WFN(24), WFS(24), WFE(48), WFW(48), RCV(24), XND(48), XUND(48),
#YND(24), YVND(24)
COMMON
1/FLUPR/URFVIS, VISCOS, DENSIT, PRANDT, DEN(48,24), VIS(48,24)
1/COEF/AP(48,24), AN(48,24), AS(48,24), AE(48,24), AW(48,24), SU(48,24),
1 SP(48,24)
1/KASE T1/UIH, TEIN, EDIN, FLOWIN, ALAMDA,
2 RSMALL, RLARGE, AL1, AL2, JSTEP, ISTEP, JSTP1, JSTM1, ISTP1, ISTM1
RESORM=0.0
C
CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1
C
DO 100 I=2,NIM1
DO 101 J=2,NJM1
C-----COMPUTE AREAS AND VOLUME
AREAN=RV(J+1)*SEW(I)
AREAS=RV(J)*SEW(I)
AREAEW=RCV(J)*SNS(J)
VOL=RCV(J)*SNS(J)*SEW(I)
C-----CALCULATE COEFFICIENTS
DENN=0.5*(DEN(I,J)+DEN(I,J+1))
DENS=0.5*(DEN(I,J)+DEN(I,J-1))
DENE=0.5*(DEN(I,J)+DEN(I+1,J))
DENW=0.5*(DEN(I,J)+DEN(I-1,J))
AN(I,J)=DENN*AREAN*DV(I,J+1)
AS(I,J)=DENS*AREAS*DV(I,J)
AE(I,J)=DENE*AREAEW*DU(I+1,J)
AW(I,J)=DENW*AREAEW*DU(I,J)
C-----CALCULATE SOURCE TERMS
CN=DENN*V(I,J+1)*AREAN
CS=DENS*V(I,J)*AREAS
CE=DENE*U(I+1,J)*AREAEW
CW=DENW*U(I,J)*AREAEW
SMP=CN-CS+CE-CW
SP(I,J)=0.0
SU(I,J)=-SMP
C-----COMPUTE SUM OF ABSOLUTE MASS SOURCES
RESORM=RESORM+ABS(SMP)
101 CONTINUE
100 CONTINUE
C
CHAPTER 2 2 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 2

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C		0114100
	CALL PROMOD (4)	0114200
C		0114300
CHAPTER	3 3 3 3 3 FINAL COEFFICIENT ASSEMBLY 3 3 3 3 3 3	0114400
C		0114500
	DO 300 I=2,NIM1	0114600
	DO 301 J=2,NJM1	0114700
	301 AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0114800
	300 CONTINUE	0114900
C		0115000
CHAPTER	4 4 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4	0115100
C		0115200
	DO 400 N=1,NSWPP	0115300
	400 CALL LISOLV(2,2,NI,JMAX,IT,JT,PP,4)	0115400
C		0115500
CHAPTER	5 5 5 5 CORRECT VELOCITIES AND PRESSURE 5 5 5 5 5	0115600
C		0115700
C-----	VELOCITIES	0115800
	DO 503 I=2,NIM1	0115900
	JJ=JMAX(I)	0116000
	DO 501 J=3,JJ	0116100
	V(I,J)=V(I,J)+DV(I,J)*(PP(I,J-1)-PP(I,J))	0116200
	501 CONTINUE	0116300
	JJ=JMAX(I-1)	0116400
	DO 502 J=2,JJ	0116500
	IF(I.NE. 2) U(I,J)=U(I,J)+DU(I,J)*(PP(I-1,J)-PP(I,J))	0116600
	502 CONTINUE	0116700
	503 CONTINUE	0116800
C-----	PRESSURES (WITH PROVISION FOR UNDER-RELAXATION)	0116900
	PPREF=PP(IPREF,JPREF)	0117000
	DO 506 I=2,NIM1	0117100
	JJ=JMAX(I)	0117200
	DO 508 J=2,JJ	0117300
	P(I,J)=P(I,J)+URFP*(PP(I,J)-PPREF)	0117400
C-----	PP IS ZEROED AT TOP OF CHAPTER 3, MAIN	0117500
	508 CONTINUE	0117600
	506 CONTINUE	0117700
	RETURN	0117800
	END	0117900
C		0118000
C-----		0118100
C		0118200
	SUBROUTINE CALCTE	0118300
CA*****		0118400
C		0118500
CHAPTER	0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0	0118600
C		0118700
	COMMON	0118800
	1/TEN/RESORK,NSWPK,URFK	0118900
	*VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0119000
	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0119100
	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0119200
	#,VISTAR(48,24)	0119300
	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXPI(48)	0119400
	1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYP(24),	0119500
	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0119600
	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0119700
	#YND(24),YVND(24)	0119800
	COMMON	0119900
	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0120000


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1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24), 0120100
1 SP(48,24) 0120200
1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE 0120300
1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24) 0120400
1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA, 0120500
2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1 0120600
1/SUSP/SUKD(48,24),SPKD(48,24) 0120700
C 0120800
CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 0120900
C 0121000
PRTE=1.0 0121100
DO 100 I=2,NIM1 0121200
DO 101 J=2,NJM1 0121300
C-----COMPUTE AREAS AND VOLUME 0121400
AREAN=RV(J+1)*SEW(I) 0121500
AREAS=RV(J)*SEW(I) 0121600
AREAEW=RCV(J)*SNS(J) 0121700
VOL=RCV(J)*SNS(J)*SEW(I) 0121800
C-----CALCULATE CONVECTION COEFFICIENTS 0121900
GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1) 0122000
GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J) 0122100
GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J) 0122200
GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J) 0122300
CN=GN*AREAN 0122400
CS=GS*AREAS 0122500
CE=GE*AREAEW 0122600
CW=GW*AREAEW 0122700
C-----CALCULATE DIFFUSION COEFFICIENTS 0122800
GAMN=0.5*(VIS(I,J)+VIS(I,J+1))/PRTE 0122900
GAMS=0.5*(VIS(I,J)+VIS(I,J-1))/PRTE 0123000
GAME=0.5*(VIS(I,J)+VIS(I+1,J))/PRTE 0123100
GAMW=0.5*(VIS(I,J)+VIS(I-1,J))/PRTE 0123200
DN=GAMN*AREAN/DYNP(J) 0123300
DS=GAMS*AREAS/DYPS(J) 0123400
DE=GAME*AREAEW/DXEP(I) 0123500
DW=GAMW*AREAEW/DXPW(I) 0123600
C-----SOURCE TERMS 0123700
SMP=CN-CS+CE-CW 0123800
CP=AMAX1(0.0,SMP) 0123900
CPO=CP 0124000
DUDX=(U(I+1,J)-U(I,J))/SEW(I) 0124100
DVDY=(V(I,J+1)-V(I,J))/SNS(J) 0124200
DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+ 0124300
1U(I,J-1)+U(I+1,J-1))/4.)/SNS(J) 0124400
DVDX=((V(I,J)+V(I,J+1)+V(I+1,J)+V(I+1,J+1))/4.-(V(I,J)+V(I,J+1)+V( 0124500
1I-1,J)+V(I-1,J+1))/4.)/SEW(I) 0124600
DWDY=(W(I,J+1)-W(I,J-1))/(DYNP(J)+DYPS(J))-W(I,J)/R(J) 0124700
DWDX=(W(I+1,J)-W(I-1,J))/(DXPW(I)+DXEP(I)) 0124800
GEN(I,J)=(2.*(DUDX**2+DVDY**2)+(DUDY+DVDX)**2)*VIS(I,J) 0124900
IF(INDCOS.EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)*(DWDY**2+DWDX**2) 0125000
IF(RV(J).EQ. 0.) GO TO 110 0125100
VDR=V(I,J)/RV(J) 0125200
IF(INDCOS.EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)*.5* 0125300
#(VDR+V(I,J+1)/RV(J+1))**2 0125400
GO TO 120 0125500
110 IF(INDCOS.EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)* 0125600
#0.5*(V(I,J+1)/RV(J+1))**2 0125700
120 CONTINUE 0125800
C-----ASSEMBLE MAIN COEFFICIENTS 0125900
AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN 0126000

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      AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS
      AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE
      AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW
      SU(I,J)=CPO*TE(I,J)
      SUKD(I,J)=SU(I,J)
      SU(I,J)=SU(I,J)+GEN(I,J)*VOL
      SP(I,J)=-CP
      SPKD(I,J)=SP(I,J)
      SP(I,J)=SP(I,J)-CD*CMU*DEN(I,J)**2*TE(I,J)*VOL/VIS(I,J)
101  CONTINUE
100  CONTINUE
C
CHAPTER 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2
C
      CALL PROMOD (6)
C
CHAPTER 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3
C
      RESORK=0.0
      DO 300 I=2,NIM1
      DO 301 J=2,NJM1
      AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)
      RESOR=AN(I,J)*TE(I,J+1)+AS(I,J)*TE(I,J-1)+AE(I,J)*TE(I+1,J)
1      +AW(I,J)*TE(I-1,J)-AP(I,J)*TE(I,J)+SU(I,J)
      VOL=RCV(J)*SNS(J)*SEW(I)
      SORVOL=GREAT*VOL
      IF(-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL
      RESORK=RESORK+ABS(RESOR)
C-----UNDER-RELAXATION
      AP(I,J)=AP(I,J)/URFK
      SU(I,J)=SU(I,J)+(1.-URFK)*AP(I,J)*TE(I,J)
301  CONTINUE
300  CONTINUE
C
CHAPTER 4 4 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4
C
      DO 400 N=1,NSWPK
      400 CALL LISOLV(2,2,NI,JMAX,IT,JT,TE,6)
      RETURN
      END
C
C-----
C
      SUBROUTINE CALCED
CA*****
C
CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0
C
      COMMON
      1/TDIS/RESORE,NSWPD,URFE
      1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)
      1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYP(24),
1      SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),
#      WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),
#YND(24),YVND(24)
      1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)
      1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),
1      SP(48,24)
      */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),
      *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),

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*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0132100
#,VISTAR(48,24) 0132200
COMMON 0132300
1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE 0132400
1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24) 0132500
1/SUSP/SUKD(48,24),SPKD(48,24) 0132600
1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA, 0132700
2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1 0132800
C 0132900
CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 0133000
C 0133100
DO 100 I=2,NIM1 0133200
JJ=JMAX(I) 0133300
DO 101 J=2,JJ 0133400
C-----COMPUTE AREAS AND VOLUME 0133500
AREAN=RV(J+1)*SEW(I) 0133600
AREAS=RV(J)*SEW(I) 0133700
AREAEW=RCV(J)*SNS(J) 0133800
VOL=RCV(J)*SNS(J)*SEW(I) 0133900
C-----CALCULATE CONVECTION COEFFICIENTS 0134000
GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1) 0134100
GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J) 0134200
GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J) 0134300
GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J) 0134400
CN=GN*AREAN 0134500
CS=GS*AREAS 0134600
CE=GE*AREAEW 0134700
CW=GW*AREAEW 0134800
C-----CALCULATE DIFFUSION COEFFICIENTS 0134900
GAMN=0.5*(VIS(I,J)+VIS(I,J-1))/PRED 0135000
GAMS=0.5*(VIS(I,J)+VIS(I,J-1))/PRED 0135100
GAME=0.5*(VIS(I,J)+VIS(I+1,J))/PRED 0135200
GAMW=0.5*(VIS(I,J)+VIS(I-1,J))/PRED 0135300
DN=GAMN*AREAN/DYNP(J) 0135400
DS=GAMS*AREAS/DYPS(J) 0135500
DE=GAME*AREAEW/DXEP(I) 0135600
DW=GAMW*AREAEW/DXPW(I) 0135700
C-----SOURCE TERMS 0135800
SMP=CN-CS+CE-CW 0135900
CP=AMAX1(0.0,SMP) 0136000
CPO=CP 0136100
C-----ASSEMBLE MAIN COEFFICIENTS 0136200
AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN 0136300
AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS 0136400
AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE 0136500
AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW 0136600
SU(I,J)=CPO*ED(I,J) 0136700
SUKD(I,J)=SU(I,J) 0136800
SU(I,J)=SU(I,J)+C1*CMU*GEN(I,J)*VOL*DEN(I,J)*TE(I,J)/VIS(I,J) 0136900
SP(I,J)=-CP 0137000
SPKD(I,J)=SP(I,J) 0137100
SP(I,J)=SP(I,J)-C2*DEN(I,J)*ED(I,J)*VOL/TE(I,J) 0137200
101 CONTINUE 0137300
100 CONTINUE 0137400
C 0137500
CHAPTER 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 0137600
C 0137700
CALL PROMOD (7) 0137800
C 0137900
CHAPTER 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3 0138000

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C	RESORE=0.0	0138100
	DO 300 I=2,NIM1	0138200
	DO 301 J=2,NJM1	0138300
	AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0138400
	RESOR=AN(I,J)*ED(I,J+1)+AS(I,J)*ED(I,J-1)+AE(I,J)*ED(I+1,J)	0138500
	1 +AW(I,J)*ED(I-1,J)-AP(I,J)*ED(I,J)+SU(I,J)	0138600
	VOL=RCV(J)*SNS(J)*SEW(I)	0138700
	SORVOL=GREAT*VOL	0138800
	IF(-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL	0138900
	RESORE=RESORE+ABS(RESOR)	0139000
C-----	UNDER-RELAXATION	0139100
	AP(I,J)=AP(I,J)/URFE	0139200
	SU(I,J)=SU(I,J)+(1.-URFE)*AP(I,J)*ED(I,J)	0139300
301	CONTINUE	0139400
300	CONTINUE	0139500
C		0139600
CHAPTER 4 4 4 4 4	SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4	0139700
C		0139800
	DO 400 N=1,NSWPD	0139900
400	CALL LISOLV(2,2,NI,JMAX,IT,JT,ED,7)	0140000
	RETURN	0140100
	END	0140200
C		0140300
C-----		0140400
C		0140500
	SUBROUTINE LISOLV(ISTART,JSTART,NI,JMAX,IT,JT,PHI,NCHAP)	0140600
CA*****		0140700
C		0140800
CHAPTER 0 0 0 0 0 0 0 0	PRELIMINARIES 0 0 0 0 0 0 0 0	0140900
C		0141000
	DIMENSION PHI(IT,JT),A(48),B(48),C(48),D(48),JMAX(IT)	0141100
	COMMON	0141200
	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0141300
	1 SP(48,24)	0141400
	1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,	0141500
	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0141600
	JSM1=JSTART-1	0141700
	NIM1=NI-1	0141800
	A(JSM1)=0.0	0141900
C-----	COMMENCE W-E SWEEP	0142000
	DO 100 I=ISTART,NIM1	0142100
	C(JSM1)=PHI(I,JSM1)	0142200
C-----	COMMENCE S-N TRAVERSE	0142300
	JI=JMAX(I)	0142400
	IF(NCHAP.EQ.2) JI=JMAX(I-1)	0142500
	DO 101 J=JSTART,JI	0142600
C-----	ASSEMBLE TDMA COEFFICIENTS	0142700
	A(J)=AN(I,J)	0142800
	B(J)=AS(I,J)	0142900
	C(J)=AE(I,J)*PHI(I+1,J)+AW(I,J)*PHI(I-1,J)+SU(I,J)	0143000
	D(J)=AP(I,J)	0143100
C-----	CALCULATE COEFFICIENTS OF RECURRENCE FORMULA	0143200
	TERM=1./(D(J)-B(J)*A(J-1))	0143300
	A(J)=A(J)*TERM	0143400
	C(J)=(C(J)+B(J)*C(J-1))*TERM	0143500
101	CONTINUE	0143600
C-----	OBTAIN NEW PHIS	0143700
	DO 102 JJ=JSTART,JI	0143800
	J=JI+1+JSM1-JJ	0143900
		0144000

102 PHI(I,J)=A(J)*PHI(I,J+1)+C(J)	0144100
100 CONTINUE	0144200
RETURN	0144300
END	0144400
C-----	0144500
C	0144600
SUBROUTINE PRINT(ISTART,JSTART,NI,NJ,IT,JT,X,Y,PHI,HEAD)	0144700
CA*****	0144800
C	0144900
DIMENSION PHI(IT,JT),X(IT),Y(JT),HEAD(9),STORE(48)	0145000
ISKIP=1	0145100
JSKIP=1	0145200
WRITE(6,110)HEAD	0145300
ISTA=ISTART-12	0145400
100 CONTINUE	0145500
ISTA=ISTA+12	0145600
IEND=ISTA+11	0145700
IF(NI.LT.IEND)IEND=NI	0145800
WRITE(6,111)(I,I=ISTA,IEND,ISKIP)	0145900
WRITE(6,114)(X(I),I=ISTA,IEND,ISKIP)	0146000
WRITE(6,112)	0146100
DO 101 JJ=JSTART,NJ,JSKIP	0146200
J=JSTART+NJ-JJ	0146300
DO 120 I=ISTA,IEND	0146400
A=PHI(I,J)	0146500
IF(ABS(A).LT.1.E-20) A=0.0	0146600
120 STORE(I)=A	0146700
101 WRITE(6,113)J,Y(J),(STORE(I),I=ISTA,IEND,ISKIP)	0146800
IF(IEND.LT.NI)GO TO 100	0146900
RETURN	0147000
110 FORMAT(1H0,17(2H*-),7X,9A4,7X,17(2H*-))	0147100
111 FORMAT(1H0,13H I = ,I2,11I9)	0147200
112 FORMAT(8H0 J Y)	0147300
113 FORMAT(I3,0PF8.5,1X,1P12E9.2)	0147400
114 FORMAT(11H X = ,F8.5,11F9.5)	0147500
END	0147600
C-----	0147700
C	0147800
C	0147900
SUBROUTINE PROMOD (NCHAP)	0148000
CA*****	0148100
C	0148200
CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0148300
C	0148400
COMMON	0148500
1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)	0148600
1/VVEL/RESORV,NSWVP,URFV,DYNPV(24),DYPSV(24),SNSV(24)	0148700
*/WVEL/ RESORW, NSWPW, URFW	0148800
*/VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0148900
*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0149000
*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0149100
#,VISTAR(48,24)	0149200
1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF	0149300
1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0149400
1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0149500
1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0149600
# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0149700
#YND(24),YVND(24)	0149800
COMMON	0149900
	0150000

1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0150100
1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,	0150200
2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0150300
1/SUSP/SUKD(48,24),SPKD(48,24)	0150400
1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0150500
1 SP(48,24)	0150600
1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE	0150700
1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)	0150800
IF(NCHAP .EQ. 2) GO TO 1150	0150900
IF(JSTEP .EQ. NJM1) GO TO 1150	0151000
C-----OUT OF RANGE VALUES	0151100
DO 1100 I=2,NI	0151200
IF(JMAX(I) .EQ. NJM1) GO TO 1150	0151300
JJ=JMAXP1(I)	0151400
DO 1100 J=JJ,NJM1	0151500
1100 SP(I,J)=-GREAT	0151600
1150 CONTINUE	0151700
GO TO (1,2,3,4,5,6,7,8),NCHAP	0151800
C	0151900
C	0152000
C	0152100
CHAPTER 1 1 1 1 1 1 1 1 PROPERTIES 1 1 1 1 1 1 1 1	0152200
C	0152300
1 CONTINUE	0152400
C-----NO MODIFICATIONS FOR THIS PROBLEM	0152500
RETURN	0152600
C	0152700
CHAPTER 2 2 2 2 2 2 2 2 U MOMENTUM 2 2 2 2 2 2 2 2	0152800
C	0152900
2 CONTINUE	0153000
C-----OUT OF RANGE VALUES	0153100
IF(JSTEP .EQ. NJM1) GO TO 202	0153200
DO 200 I=3,NI	0153300
IF(JMAX(I-1) .EQ. NJM1) GO TO 202	0153400
JJ=JMAXP1(I-1)	0153500
DO 200 J=JJ,NJM1	0153600
SP(I,J)=-GREAT	0153700
200 CONTINUE	0153800
202 CONTINUE	0153900
C-----TOP WALL	0154000
CDTERM=CMU**0.25	0154100
DO 210 I=3,NIM1	0154200
J=JMAX(I-1)	0154300
YP=YV(J+1)-Y(J)	0154400
SQRTK=SQRT(0.5*(TE(I,J)+TE(I-1,J)))	0154500
DENU=0.5*(DEN(I,J)+DEN(I-1,J))	0154600
YPLUSA=0.5*(YPLUSN(I)+YPLUSN(I-1))	0154700
IF(YPLUSA.LE.11.63) GO TO 211	0154800
TMULT=DENU*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSA)	0154900
GO TO 212	0155000
211 TMULT=VISCOS/YP	0155100
212 CONTINUE	0155200
205 SP(I,J)=SP(I,J)-TMULT*SEWU(I)*RV(J+1)	0155300
IF(JMAX(I-1) .NE. JMAX(I)) SP(I,J)=SP(I,J)/2.	0155400
210 AN(I,J)=0.	0155500
C-----SIDE WALL	0155600
IF(JSTEP .EQ. NJM1) GO TO 214	0155700
DO 225 I=3,NIM1	0155800
IF(JMAX(I-2) .GE. JMAX(I-1)) GO TO 225	0155900
JJ=JMAXP1(I-2)	0156000

JI=JMAX(I-1)	0156100
DO 220 J=JJ,JI	0156200
AW(I,J)=0.	0156300
220 CONTINUE	0156400
225 CONTINUE	0156500
C-----SYMMETRY AXIS	0156600
214 CONTINUE	0156700
DO 203 I=1,NI	0156800
203 AS(I,2)=0.	0156900
C-----OUTLET	0157000
ARDENT=0.0	0157100
FLOW=0.0	0157200
DO 209 J=2,NJM1	0157300
ARDEN=0.50*(DEN(NIM1,J)+DEN(NIM1-1,J))*RCV(J)*SNS(J)	0157400
ARDENT=ARDENT+ARDEN	0157500
209 FLOW=FLOW+ARDEN*U(NIM1,J)	0157600
UINC=(FLOWIN-FLOW)/ARDENT	0157700
DO 215 J=2,NJM1	0157800
215 U(NI,J)=U(NIM1,J)+UINC	0157900
RETURN	0158000
C	0158100
CHAPTER 3 3 3 3 3 3 3 3 V MOMENTUM 3 3 3 3 3 3 3 3	0158200
C	0158300
3 CONTINUE	0158400
C-----SIDE WALL	0158500
IF(JSTEP .EQ. NJM1) GO TO 314	0158600
CDTERM=CMU**0.25	0158700
DO 325 I=2,NIM1	0158800
IF(JMAX(I-1) .GE. JMAX(I)) GO TO 325	0158900
JJ=JMAXPI(I-1)	0159000
JI=JMAX(I)	0159100
DO 320 J=JJ,JI	0159200
XP=X(I)-XU(I)	0159300
SQRTK=SQRT(0.5*(TE(I,J)+TE(I,J-1)))	0159400
DENV=0.5*(DEN(I,J)+DEN(I,J-1))	0159500
XPLUSA=0.5*(XPLUSW(J)+XPLUSW(J-1))	0159600
IF(XPLUSA.LE.11.63) GO TO 311	0159700
TMULT=DENV*CDTERM*SQRTK*CAPPA/ALOG(ELONG*XPLUSA)	0159800
GO TO 312	0159900
311 TMULT=VISCONS/XP	0160000
312 CONTINUE	0160100
305 SP(I,J)=SP(I,J)-TMULT*SNSV(J)*RV(J)	0160200
IF(J .EQ. JMAXPI(I-1)) SP(I,J)=SP(I,J)/2.	0160300
310 AW(I,J)=0.0	0160400
320 CONTINUE	0160500
325 CONTINUE	0160600
C-----TOP WALL	0160700
314 CONTINUE	0160800
DO 313 I=2,NIM1	0160900
J=JMAX(I)	0161000
313 AN(I,J)=0.	0161100
RETURN	0161200
C	0161300
CHAPTER 4 4 4 4 4 4 PRESSURE CORRECTION 4 4 4 4 4 4 4 4	0161400
C	0161500
4 CONTINUE	0161600
C-----SIDE WALL	0161700
IF(JSTEP .EQ. NJM1) GO TO 414	0161800
DO 412 I=2,NIM1	0161900
IF(JMAX(I-1) .GE. JMAX(I)) GO TO 412	0162000

JJ=JMAXPI(I-1)	0162100
JI=JMAX(I)	0162200
DO 410 J=JJ,JI	0162300
AW(I,J)=0.	0162400
410 CONTINUE	0162500
412 CONTINUE	0162600
C-----TOP WALL	0162700
414 CONTINUE	0162800
DO 402 I=2,NIM1	0162900
J=JMAX(I)	0163000
402 AN(I,J)=0.0	0163100
C-----SYMMETRY AXIS	0163200
DO 420 I=2,NIM1	0163300
AS(I,2)=0.0	0163400
420 CONTINUE	0163500
C-----OUTLET	0163600
DO 440 J=2,NJM1	0163700
AE(NIM1,J)=0.0	0163800
440 CONTINUE	0163900
RETURN	0164000
C	0164100
CHAPTER 5 5 5 5 5 5 THERMAL ENERGY 5 5 5 5 5 5 5 5	0164200
C	0164300
5 CONTINUE	0164400
C-----NO MODIFICATIONS FOR THIS PROBLEM	0164500
RETURN	0164600
C	0164700
CHAPTER 6 6 6 6 6 TURBULENT KINETIC ENERGY 6 6 6 6 6 6 6 6	0164800
C	0164900
C	0165000
6 CONTINUE	0165100
C-----TOP WALL	0165200
CDTERM=CMU*0.25	0165300
DO 610 I=2,NIM1	0165400
J=JMAX(I)	0165500
DWDY=(W(I,J+1)-W(I,J-1))/(DYNP(J)+DYPS(J))	0165600
UAVG=U(I,J)*WFE(I)+(1.-WFE(I))*U(I+1,J)	0165700
UEFF=SQRT(UAVG*UAVG + W(I,J)*W(I,J))	0165800
YP=YV(J+1)-Y(J)	0165900
DENU=DEN(I,J)	0166000
SQRTK=SQRT(TE(I,J))	0166100
VOL=RCV(J)*SNS(J)*SEW(I)	0166200
YPLUSN(I)=DENU*SQRTK*CDTERM*YP/VISCOS	0166300
IF(YPLUSN(I) .LE. 11.63) GO TO 608	0166400
TMULT=DENU*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSN(I))	0166500
TAUN(I)=-TMULT*UEFF	0166600
DITERM=DEN(I,J)*(CMU*.75)*SQRTK*ALOG(ELOG*YPLUSN(I))/(CAPPA*YP)	0166700
GO TO 609	0166800
608 TAURX=-VISCOS*UAVG/YP	0166900
TAURW=VISCOS*(-W(I,J)/YP - W(I,J)/Y(J))	0167000
TAUN(I)=SQRT(TAURX**2+TAURW**2)	0167100
DITERM=DEN(I,J)*(CMU*.75)*SQRTK*YPLUSN(I)/YP	0167200
609 DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+U(I,J-1)+U(I+1,J-1))/4.)/SNS(J)	0167300
GENCOU=TAUN(I)**2/VIS(I,J)	0167400
GENRES=GEN(I,J)-VIS(I,J)*(DUDY**2+(DWDY-W(I,J)/Y(J))**2)	0167500
GEN(I,J)=GENRES+GENCOU	0167600
SU(I,J)=GEN(I,J)*VOL+SUKD(I,J)	0167700
SP(I,J)=-DITERM*VOL+SPKD(I,J)	0167800
AN(I,J)=0.0	0167900
	0168000

610	CONTINUE	0168100
	TAUN(NI)=TAUN(NIM1)	0168200
C-----	-----SIDE WALL	0168300
	IF(JSTEP.EQ.NJM1) GO TO 614	0168400
	DO 625 I=2,NIM1	0168500
	IF(JMAX(I-1).GE.JMAX(I)) GO TO 625	0168600
	JJ=JMAXP1(I-1)	0168700
	JI=JMAX(I)	0168800
	DO 620 J=JJ,JI	0168900
	DWDX=(W(I+1,J)-W(I-1,J))/(DXPW(I)+DXEP(I))	0169000
	VAVG=V(I,J)*WFN(J)+(1.-WFN(J))*V(I,J+1)	0169100
	VEFF=SQRT(VAVG*VAVG + W(I,J)*W(I,J))	0169200
	XP=X(I)-XU(I)	0169300
	DENV=DEN(I,J)	0169400
	SQRTK=SQRT(TE(I,J))	0169500
	VOL=RCV(J)*SHS(J)*SEW(I)	0169600
	XPLUSW(J)=DENV*SQRTK*CDTERM*XP/VISCOS	0169700
	IF(XPLUSW(J).LE.11.63) GO TO 621	0169800
	TMULT=DENV*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSW(J))	0169900
	TAUW(J)=-TMULT*VEFF	0170000
	DITERM=DEN(I,J)*(CMU*.75)*SQRTK*ALOG(ELOG*XPLUSW(J))/(CAPPA*XP)	0170100
	GO TO 622	0170200
621	TAUXR=VISCOS*VAVG/XP	0170300
	TAUXW=VISCOS*W(I,J)/XP	0170400
	TAUW(J)=SQRT(TAUXR**2+TAUXW**2)	0170500
	DITERM=DEN(I,J)*(CMU*.75)*SQRTK*XPLUSW(J)/XP	0170600
622	DVDX=((V(I,J)+V(I,J+1)+V(I+1,J)+V(I+1,J+1))/4.-(V(I,J)+V(I,J+1)+V(I-1,J)+V(I-1,J+1))/4.)/SEW(I)	0170700
	GENCOU=TAUW(J)**2/VIS(I,J)	0170800
	GENRES=GEN(I,J)-VIS(I,J)*(DVDX**2+DWDX**2)	0170900
	GEN(I,J)=GENRES+GENCOU	0171000
	SU(I,J)=SU(I,J)+SUKD(I,J)+GEN(I,J)*VOL	0171100
	SP(I,J)=SP(I,J)+SPKD(I,J)-DITERM*VOL	0171200
	AW(I,J)=0.0	0171300
620	CONTINUE	0171400
625	CONTINUE	0171500
	TAUW(NJ)=TAUW(NJM1)	0171600
C-----	-----SYMMETRY AXIS	0171700
614	CONTINUE	0171800
	J=2	0171900
	DO 630 I=2,NIM1	0172000
	DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+U(I,J-1)+U(I+1,J-1))/4.)/SNS(J)	0172100
	VOL=RCV(J)*SNS(J)*SEW(I)	0172200
	GEN(I,J)=GEN(I,J)-VIS(I,J)*DUDY**2	0172300
	SU(I,J)=SUKD(I,J)+GEN(I,J)*VOL	0172400
630	AS(I,2)=0.0	0172500
C-----	-----OUTLET	0172600
	DO 640 J=2,NJM1	0172700
	AE(NIM1,J)=0.0	0172800
640	CONTINUE	0172900
	RETURN	0173000
C		0173100
CHAPTER	7 7 7 7 7 7 7 7 DISSIPATION 7 7 7 7 7 7 7 7	0173200
C		0173300
7	CONTINUE	0173400
C-----	-----TOP WALL	0173500
	DO 710 I=2,NIM1	0173600
	J=JMAX(I)	0173700
	YP=YV(J+1)-Y(J)	0173800
		0173900
		0174000


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851  TMULT=VISCOS/XP                                0180100
852  SP(I,J)=SP(I,J)-TMULT*SNS(J)*RCV(J)             0180200
      AW(I,J)=0.                                     0180300
850  CONTINUE                                         0180400
855  CONTINUE                                         0180500
C-----SYMMETRY AXIS                                0180600
814  CONTINUE                                         0180700
C-----FIX W FOR SOLID BODY ROTATION AT J=2 USING W AT J=3 0180800
      DO 860 I=2,NIM1                                0180900
        TERM=W(I,3)*R(2)/R(3)                        0181000
        SU(I,2)=GREAT*TERM                            0181100
860  SP(I,2)=-GREAT                                  0181200
C-----OUTLET                                         0181300
      DO 870 J=2,NJM1                                0181400
870  AE(NIM1,J)=0.                                    0181500
      RETURN                                           0181600
      END                                              0181700
C                                                     0181800
C-----                                                0181900
C                                                     0182000
      SUBROUTINE STRMFN                                0182100
CA*****                                              0182200
C                                                     0182300
CHAPTER 0 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0 0182400
C                                                     0182500
      COMMON                                           0182600
      1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24) 0182700
      */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0182800
      *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24), 0182900
      *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0183000
      #,VISTAR(48,24)                                0183100
      1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXPI(48) 0183200
      1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24), 0183300
      1      SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24), 0183400
      # WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48), 0183500
      #YND(24),YVND(24)                              0183600
      1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,          0183700
      2      RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1 0183800
      1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT 0183900
      LOGICAL INPLOT                                  0184000
C                                                     0184100
CHAPTER 1 1 1 1 1 CALCULATE STREAM FCN BASED ON VOLUMETRIC FLOW 0184200
C                                                     0184300
C                                                     0184400
      Q=UIN*(RSMALL**2)/2.                            0184500
      DO 400 I=2,NI                                    0184600
      IF(JMAX(I-1) .LT. 5) GO TO 400                  0184700
      STFN(I,2)=(Y(2)*R(2)*U(I,2)*.5)/Q              0184800
      JJ=JMAX(I-1)                                    0184900
      DO 200 J=3,JJ                                    0185000
      STFN(I,J)=STFN(I,J-1)+SNSV(J)*(R(J-1)*U(I,J-1)+R(J)*U(I,J))*5/Q 0185100
200  CONTINUE                                         0185200
400  CONTINUE                                         0185300
C                                                     0185400
      DO 800 I=2,NI                                    0185500
      IJ=JMAXPI(I-1)                                  0185600
      DO 700 K=1,NSTLN                                0185700
      AK=K-1                                           0185800
      STVAL(K)=AK*.1                                  0185900
      JJ=JMAX(I-1)                                    0186000

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DO 600 J=2,JJ                                0186100
IF(STFN(I,J) .GE. STVAL(K)) GO TO 650          0186200
600 CONTINUE                                  0186300
YSTLN(I,K)=RV(IJ)                             0186400
GO TO 670                                       0186500
650 IF(J .EQ. 2) YSTLN(I,K)=0.0               0186600
IF(J .EQ. 2) GO TO 670                         0186700
SLOPE=(STVAL(K)-STFN(I,J-1))/(STFN(I,J)-STFN(I,J-1)) 0186800
YSTLN(I,K)=Y(J-1)+SLOPE*(Y(J)-Y(J-1))         0186900
670 CONTINUE                                  0187000
YSTLND(I,K)=YSTLN(I,K)/(2.*RLARGE)            0187100
700 CONTINUE                                  0187200
800 CONTINUE                                  0187300
IF(.NOT. INPLOT) GO TO 745                     0187400
N=0                                             0187500
DO 730 K=1,11,2                                0187600
N=N+1                                           0187700
DO 730 I=1,NIM1                                0187800
YSLPLT(N,I)=YSTLND(I+1,K)                     0187900
730 CONTINUE                                  0188000
DO 740 I=1,NIM1                                0188100
XUDPLT(I)=XUND(I+1)                           0188200
740 CONTINUE                                  0188300
745 NPTS=NIM1                                  0188400
RETURN                                          0188500
END                                              0188600
C                                              0188700
C                                              0188800
SUBROUTINE PLOT (X,IDIM,IMAX,XAXIS,Y,JDIM,JMAX,YAXES,SYMB L,LA) 0188900
CA*****                                     0189000
C                                     0189100
C SUBROUTINE FOR PLOTTING J CURVES OF Y(J,I) AGAINST X(I).      0189200
C                                     0189300
C X AND Y ARE ASSUMED TO BE IN ANY RANGE EXCEPT THAT NEGATIVE VALUES * 0189400
C ARE PLOTTED AS ZERO. * 0189500
C X AND Y ARE SCALED TO THE RANGE 0. TO 1. BY DIVISION BY THE MAXIMA, * 0189600
C WHICH ARE ALSO PRINTED. 0189700
C IDIM IS THE VARIABLE DIMENSION FOR X. 0189800
C IMAX IS THE NUMBER OF X VALUES. 0189900
C XAXIS STORES THE NAME OF THE X-AXIS. 0190000
C JDIM IS THE VARIABLE DIMENSION FOR Y. 0190100
C JMAX IS THE NUMBER OF CURVES TO BE PLOTTED, (UP TO 10). 0190200
C THE ARRAY YAXES(J) STORES THE NAMES OF THE CURVES. 0190300
C THE ARRAY SYMBOL(J) STORES THE SINGLE CHARACTERS USED FOR PLOTTING. * 0190400
C 0190500
CA*****                                     0190600
DIMENSION X(IDIM),Y(JDIM,IDIM),YAXES(JDIM),SYMB L(JDIM),
1 A(101),YMAX(10)
DATA DOT,CROSS,BLANK/1H.,1H+,1H /
C-----SCALING X ARRAY TO THE RANGE 0 TO 50 0191000
XMAX=1.E-30 0191100
DO 1 I=1,IMAX 0191200
IF(X(I).GT.XMAX) XMAX=X(I) 0191300
1 CONTINUE 0191400
DO 2 I=1,IMAX 0191500
X(I)=X(I)/XMAX*50. 0191600
IF(X(I).LT.0.) X(I)=0. 0191700
2 CONTINUE 0191800
C-----SCALING Y ARRAY TO THE RANGE 0 TO 100 0191900
DO 3 J=1,JMAX 0192000

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YMAX(J)=1.E-30	0192100
DO 4 I=1,IMAX	0192200
IF(Y(J,I).GT.YMAX(J)) YMAX(J)=Y(J,I)	0192300
4 CONTINUE	0192400
DO 3 I=1,IMAX	0192500
C NO Y SCALING	0192600
Y(J,I)=Y(J,I)*100.0	0192700
IF(LA.EQ.1) Y(J,I)=0.02*Y(J,I)	0192800
IF(Y(J,I).LT.0.) Y(J,I)=0.	0192900
3 CONTINUE	0193000
C-----IDENTIFYING THE VARIOUS CURVES TO BE PLOTTED	0193100
WRITE(6,103) XAXIS	0193200
WRITE(6,100) (YAXES(I),I=1,JMAX)	0193300
WRITE(6,106) (SYMB L(I),I=1,JMAX)	0193400
WRITE(6,102) (YMAX(I),I=1,JMAX)	0193500
DO 5 I=1,11	0193600
5 A(I)=0.1*(I-1)	0193700
IF(LA.EQ.1) WRITE(6,120)	0193800
IF(LA.EQ.0) WRITE(6,115)	0193900
WRITE(6,101) (A(I),I=1,11)	0194000
C-----MAIN LOOP. EACH PASS PRODUCES AN X-CONSTANT LINE.	0194100
DO 40 II=1,51	0194200
I=II	0194300
IF(I.EQ.1.OR.I.EQ.51) GO TO 32	0194400
GO TO 33	0194500
C-----ALLOCATE . OR + AS MARKER ON THE Y-AXIS	0194600
32 DO 30 K=1,101	0194700
30 A(K)=DOT	0194800
DO 31 K=11,101,10	0194900
31 A(K)=CROSS	0195000
C-----ALLOCATE . OR + MARK ON THE X-AXIS, ALSO THE APPROPRIATE	0195100
C-----X VALUE	0195200
33 A(1)=DOT	0195300
A(101)=DOT	0195400
K=I-1	0195500
46 K=K-5	0195600
IF(K)48,47,46	0195700
47 A(1)=CROSS	0195800
A(101)=CROSS	0195900
48 XL=0.02*(I-1)	0196000
C-----CHECK IF ANY Y(X(I)) VALUE LIES ON THIS X-CONSTANT LINE	0196100
C-----IF YES GO TO 41, OTHERWISE GO TO 42	0196200
DO 43 K=1,IMAX	0196300
IFIX=X(K)+1.5	0196400
IF(IFIX-I)43,41,43	0196500
C-----LOCATE Y(X(I))	0196600
41 DO 44 J=1,JMAX	0196700
NY=Y(J,K)+1.5	0196800
A(NY)=SYMB L(J)	0196900
44 CONTINUE	0197000
GO TO 42	0197100
43 CONTINUE	0197200
C-----PRINT X-CONSTANT LINE	0197300
42 CONTINUE	0197400
IF(LA.EQ.1) GO TO 51	0197500
WRITE(6,105) XL,(A(K),K=1,101),XL	0197600
GO TO 52	0197700
51 WRITE(6,107) XL,(A(K),K=1,101),XL	0197800
52 CONTINUE	0197900
C-----PUTTING BLANKS INTO X-CONSTANT LINE	0198000

DO 49 K=1,101	0198100
49 A(K)=BLANK	0198200
40 CONTINUE	0198300
DO 50 I=1,11	0198400
50 A(I)=.1*(I-1)	0198500
WRITE(6,104)(A(I),I=1,11)	0198600
WRITE(6,130)	0198700
RETURN	0198800
100 FORMAT(11H Y-AXES ARE,5X,10(1X,A10))	0198900
101 FORMAT(1H0,2X,11F10.1)	0199000
102 FORMAT(15H MAXIMUM VALUES, 10E11.3)	0199100
103 FORMAT(11H1X-AXIS IS ,A3)	0199200
104 FORMAT(3X,11F10.1)	0199300
105 FORMAT(2H X,F6.2,3X,101A1,F6.2)	0199400
106 FORMAT(7H SYMBOL,11X,10(1X,A10))	0199500
107 FORMAT(2H X,F6.2,3X,101A1,F6.2)	0199600
115 FORMAT(//,T50,'RADIAL POSITION R/D',/)	0199700
120 FORMAT(//,T50,'RADIAL POSITION 2R/D',/)	0199800
130 FORMAT(///,T45,'DIMENSIONLESS STREAMLINE PLOT')	0199900
RETURN	0200000
END	0200100
U VELOCITY	0200600
V VELOCITY	0200700
W VELOCITY	0200800
PRESSURE	0200900
TEMPERATURE	0201000
TURBULENCE ENERGY	0201100
TURBULENCE DISSIPATION	0201200
VISCOSITY	0201300
DIMENSIONLESS LENGTH SCALE	0201400
DIMENSIONLESS STREAM FUNCTION	0201500
RADIAL COORDINATE OF STREAMLINES	0201600
DIMENSIONLESS U VELOCITY	0201700
DIMENSIONLESS V VELOCITY	0201800
DIMENSIONLESS W VELOCITY	0201900
DIMENSIONLESS PRESSURE	0202000
DIMENSIONLESS TURBULENCE ENERGY	0202100
DIMENSIONLESS STREAMLINE COORDS	0202200
DIMENSIONLESS EFF. VISCOSITY	0202300

AXISYMMETRIC, ISOTHERMAL, GT COMBUSTOR FLOWFIELD SIMULATION
USING THE STAIRSTEP APPROXIMATION FOR THE SLOPING EXPANSION WALL
AND THE K-E TURBULENCE MODEL

EXPANSION ANGLE(DEG.) =	4.479E 01
INLET RADIUS(M) =	3.125E-02
COMBUSTOR RADIUS(M) =	6.250E-02
COMBUSTOR LENGTH(M) =	5.004E-01
INLET REYNOLDS NO.(USING DIAM.) =	1.261E 05
LAMINAR VISCOSITY(KG/M/SEC) =	1.800E-05
DENSITY(KG/CU. M) =	1.211E 00

[illegible]

99	0.3567E	00	0.3344E-01	0.5000E-02	0.4762E-02	0.2128E-01	0.8849E	08	0.1188E	02-0.5459E-01	0.0000	0.1809E	03	0.7885E	03
100	0.3505E	00	0.3331E-01	0.5000E-02	0.4726E-02	0.2044E-01	0.8344E	08	0.1179E	02-0.5325E-01	0.0000	0.1818E	03	0.7998E	03
101	0.3442E	00	0.3257E-01	0.5000E-02	0.4422E-02	0.1976E-01	0.7834E	08	0.1170E	02-0.5194E-01	0.0000	0.1827E	03	0.8100E	03
102	0.3379E	00	0.3240E-01	0.5000E-02	0.4415E-02	0.1923E-01	0.7353E	08	0.1162E	02-0.5067E-01	0.0000	0.1835E	03	0.8193E	03
103	0.3315E	00	0.3167E-01	0.5000E-02	0.4156E-02	0.1882E-01	0.6939E	08	0.1153E	02-0.4942E-01	0.0000	0.1843E	03	0.8276E	03
104	0.3250E	00	0.3147E-01	0.5000E-02	0.4164E-02	0.1850E-01	0.6523E	08	0.1145E	02-0.4820E-01	0.0000	0.1851E	03	0.8350E	03
105	0.3184E	00	0.3075E-01	0.5000E-02	0.3932E-02	0.1827E-01	0.6172E	08	0.1137E	02-0.4701E-01	0.0000	0.1859E	03	0.8415E	03
106	0.3118E	00	0.3052E-01	0.5000E-02	0.3931E-02	0.1812E-01	0.5834E	08	0.1129E	02-0.4585E-01	0.0000	0.1867E	03	0.8472E	03
107	0.3051E	00	0.2982E-01	0.5000E-02	0.3715E-02	0.1804E-01	0.5489E	08	0.1122E	02-0.4471E-01	0.0000	0.1874E	03	0.8520E	03
108	0.2985E	00	0.2956E-01	0.5000E-02	0.3685E-02	0.1804E-01	0.5172E	08	0.1114E	02-0.4360E-01	0.0000	0.1882E	03	0.8560E	03
109	0.2917E	00	0.2887E-01	0.5000E-02	0.3471E-02	0.1809E-01	0.4902E	08	0.1107E	02-0.4251E-01	0.0000	0.1889E	03	0.8593E	03
110	0.2851E	00	0.2858E-01	0.5000E-02	0.3432E-02	0.1816E-01	0.4596E	08	0.1100E	02-0.4144E-01	0.0000	0.1896E	03	0.8619E	03
111	0.2783E	00	0.2790E-01	0.5000E-02	0.3216E-02	0.1826E-01	0.4337E	08	0.1093E	02-0.4040E-01	0.0000	0.1902E	03	0.8638E	03
112	0.2717E	00	0.2760E-01	0.5000E-02	0.3182E-02	0.1838E-01	0.4008E	08	0.1086E	02-0.3937E-01	0.0000	0.1907E	03	0.8651E	03
113	0.2650E	00	0.2692E-01	0.5000E-02	0.2982E-02	0.1853E-01	0.3751E	08	0.1080E	02-0.3837E-01	0.0000	0.1913E	03	0.8657E	03
114	0.2584E	00	0.2661E-01	0.5000E-02	0.2954E-02	0.1868E-01	0.3483E	08	0.1073E	02-0.3739E-01	0.0000	0.1918E	03	0.8657E	03
115	0.2518E	00	0.2594E-01	0.5000E-02	0.2777E-02	0.1886E-01	0.3254E	08	0.1067E	02-0.3643E-01	0.0000	0.1923E	03	0.8652E	03
116	0.2452E	00	0.2561E-01	0.5000E-02	0.2750E-02	0.1902E-01	0.3062E	08	0.1061E	02-0.3549E-01	0.0000	0.1928E	03	0.8641E	03
117	0.2387E	00	0.2495E-01	0.5000E-02	0.2593E-02	0.1917E-01	0.2871E	08	0.1055E	02-0.3456E-01	0.0000	0.1932E	03	0.8626E	03
118	0.2322E	00	0.2461E-01	0.5000E-02	0.2567E-02	0.1932E-01	0.2768E	08	0.1049E	02-0.3366E-01	0.0000	0.1937E	03	0.8606E	03
119	0.2258E	00	0.2397E-01	0.5000E-02	0.2421E-02	0.1945E-01	0.2610E	08	0.1043E	02-0.3277E-01	0.0000	0.1941E	03	0.8582E	03
120	0.2195E	00	0.2362E-01	0.5000E-02	0.2385E-02	0.1955E-01	0.2490E	08	0.1038E	02-0.3190E-01	0.0000	0.1946E	03	0.8553E	03
121	0.2132E	00	0.2298E-01	0.5000E-02	0.2246E-02	0.1964E-01	0.2378E	08	0.1033E	02-0.3105E-01	0.0000	0.1949E	03	0.8521E	03
122	0.2070E	00	0.2263E-01	0.5000E-02	0.2212E-02	0.1971E-01	0.2300E	08	0.1027E	02-0.3021E-01	0.0000	0.1953E	03	0.8485E	03
123	0.2009E	00	0.2201E-01	0.5000E-02	0.2076E-02	0.1976E-01	0.2204E	08	0.1022E	02-0.2939E-01	0.0000	0.1957E	03	0.8446E	03
124	0.1949E	00	0.2166E-01	0.5000E-02	0.2042E-02	0.1980E-01	0.2158E	08	0.1017E	02-0.2859E-01	0.0000	0.1960E	03	0.8404E	03
125	0.1889E	00	0.2104E-01	0.5000E-02	0.1911E-02	0.1982E-01	0.2045E	08	0.1012E	02-0.2780E-01	0.0000	0.1963E	03	0.8359E	03
126	0.1831E	00	0.2068E-01	0.5000E-02	0.1885E-02	0.1982E-01	0.1980E	08	0.1008E	02-0.2703E-01	0.0000	0.1966E	03	0.8312E	03
127	0.1773E	00	0.2008E-01	0.5000E-02	0.1766E-02	0.1979E-01	0.1916E	08	0.1003E	02-0.2627E-01	0.0000	0.1969E	03	0.8262E	03
128	0.1717E	00	0.1972E-01	0.5000E-02	0.1737E-02	0.1974E-01	0.1847E	08	0.9985E	01-0.2553E-01	0.0000	0.1972E	03	0.8210E	03
129	0.1661E	00	0.1914E-01	0.5000E-02	0.1636E-02	0.1966E-01	0.1780E	08	0.9941E	01-0.2481E-01	0.0000	0.1974E	03	0.8156E	03
130	0.1607E	00	0.1878E-01	0.5000E-02	0.1604E-02	0.1957E-01	0.1749E	08	0.9898E	01-0.2409E-01	0.0000	0.1977E	03	0.8100E	03
131	0.1553E	00	0.1821E-01	0.5000E-02	0.1507E-02	0.1947E-01	0.1680E	08	0.9857E	01-0.2340E-01	0.0000	0.1979E	03	0.8042E	03
132	0.1501E	00	0.1785E-01	0.5000E-02	0.1479E-02	0.1934E-01	0.1653E	08	0.9816E	01-0.2271E-01	0.0000	0.1981E	03	0.7983E	03
133	0.1449E	00	0.1730E-01	0.5000E-02	0.1390E-02	0.1919E-01	0.1595E	08	0.9777E	01-0.2204E-01	0.0000	0.1983E	03	0.7923E	03
134	0.1399E	00	0.1694E-01	0.5000E-02	0.1360E-02	0.1903E-01	0.1541E	08	0.9738E	01-0.2138E-01	0.0000	0.1985E	03	0.7862E	03
135	0.1350E	00	0.1640E-01	0.5000E-02	0.1275E-02	0.1885E-01	0.1501E	08	0.9701E	01-0.2074E-01	0.0000	0.1987E	03	0.7800E	03
136	0.1302E	00	0.1605E-01	0.5000E-02	0.1250E-02	0.1866E-01	0.1482E	08	0.9665E	01-0.2011E-01	0.0000	0.1989E	03	0.7737E	03
137	0.1255E	00	0.1552E-01	0.5000E-02	0.1166E-02	0.1844E-01	0.1440E	08	0.9630E	01-0.1949E-01	0.0000	0.1991E	03	0.7673E	03
138	0.1209E	00	0.1518E-01	0.5000E-02	0.1145E-02	0.1822E-01	0.1429E	08	0.9595E	01-0.1889E-01	0.0000	0.1992E	03	0.7608E	03
139	0.1164E	00	0.1467E-01	0.5000E-02	0.1069E-02	0.1798E-01	0.1385E	08	0.9562E	01-0.1830E-01	0.0000	0.1994E	03	0.7544E	03
140	0.1120E	00	0.1433E-01	0.5000E-02	0.1045E-02	0.1773E-01	0.1346E	08	0.9529E	01-0.1772E-01	0.0000	0.1995E	03	0.7478E	03
141	0.1077E	00	0.1383E-01	0.5000E-02	0.9787E-03	0.1747E-01	0.1316E	08	0.9498E	01-0.1715E-01	0.0000	0.1996E	03	0.7413E	03
142	0.1036E	00	0.1350E-01	0.5000E-02	0.9535E-03	0.1720E-01	0.1300E	08	0.9467E	01-0.1659E-01	0.0000	0.1998E	03	0.7348E	03
143	0.9953E-01	0.1303E-01	0.5000E-02	0.8928E-03	0.1692E-01	0.1263E	08	0.9438E	01-0.1605E-01	0.0000	0.1999E	03	0.7282E	03	
144	0.9561E-01	0.1270E-01	0.5000E-02	0.8723E-03	0.1663E-01	0.1251E	08	0.9409E	01-0.1552E-01	0.0000	0.2000E	03	0.7217E	03	
145	0.9178E-01	0.1224E-01	0.5000E-02	0.8168E-03	0.1634E-01	0.1212E	08	0.9381E	01-0.1500E-01	0.0000	0.2001E	03	0.7151E	03	
146	0.8808E-01	0.1192E-01	0.5000E-02	0.7946E-03	0.1604E-01	0.1186E	08	0.9353E	01-0.1449E-01	0.0000	0.2002E	03	0.7086E	03	
147	0.8446E-01	0.1148E-01	0.5000E-02	0.7415E-03	0.1573E-01	0.1182E	08	0.9327E	01-0.1399E-01	0.0000	0.2002E	03	0.7021E	03	
148	0.8097E-01	0.1116E-01	0.5000E-02	0.7234E-03	0.1541E-01	0.1136E	08	0.9301E	01-0.1350E-01	0.0000	0.2003E	03	0.6957E	03	
149	0.7757E-01	0.1074E-01	0.5000E-02	0.6720E-03	0.1509E-01	0.1121E	08	0.9277E	01-0.1303E-01	0.0000	0.2004E	03	0.6893E	03	
150	0.7428E-01	0.1043E-01	0.5000E-02	0.6583E-03	0.1477E-01	0.1075E	08	0.9253E	01-0.1256E-01	0.0000	0.2005E	03	0.6829E	03	
151	0.7108E-01	0.1003E-01	0.5000E-02	0.6040E-03	0.1445E-01	0.1052E	08	0.9229E	01-0.1211E-01	0.0000	0.2005E	03	0.6766E	03	
152	0.6799E-01	0.9733E-02	0.5000E-02	0.5969E-03	0.1412E-01	0.1027E	08	0.9207E	01-0.1166E-01	0.0000	0.2006E	03	0.6704E	03	

13	0.04328	0.00	0.00	1.02E 00	2.09E 00	4.36E 00	7.93E 00	1.22E 01	1.70E 01	2.23E 01	2.81E 01	3.40E 01	3.91E 01
12	0.04094	0.00	0.00	1.57E 00	4.77E 00	8.22E 00	1.16E 01	1.55E 01	2.01E 01	2.53E 01	3.09E 01	3.67E 01	4.17E 01
11	0.03719	0.00	2.35E 00	1.13E 01	1.91E 01	2.00E 01	2.06E 01	2.24E 01	2.53E 01	2.93E 01	3.41E 01	3.92E 01	4.38E 01
10	0.03437	0.00	1.35E 01	4.60E 01	4.08E 01	3.47E 01	3.07E 01	2.93E 01	2.99E 01	3.20E 01	3.53E 01	3.94E 01	4.34E 01
9	0.03219	0.00	7.34E 01	7.13E 01	5.51E 01	4.23E 01	3.47E 01	3.14E 01	3.09E 01	3.19E 01	3.42E 01	3.74E 01	4.10E 01
8	0.03031	2.70E 01	1.37E 01	1.23E 01	1.40E 01	1.76E 01	2.18E 01	2.53E 01	2.74E 01	2.85E 01	3.03E 01	3.34E 01	3.72E 01
7	0.02687	2.70E 01	8.89E 00	4.04E 00	2.28E 00	1.66E 00	1.77E 00	2.65E 00	4.82E 00	8.91E 00	1.46E 01	2.02E 01	2.56E 01
6	0.02187	2.70E 01	8.89E 00	4.04E 00	2.23E 00	1.41E 00	9.68E-01	7.12E-01	5.79E-01	6.78E-01	1.39E 00	3.83E 00	8.81E 00
5	0.01625	2.70E 01	8.89E 00	4.04E 00	2.24E 00	1.41E 00	9.69E-01	7.10E-01	5.43E-01	4.28E-01	3.46E-01	3.82E-01	1.13E 00
4	0.01062	2.70E 01	8.89E 00	4.04E 00	2.24E 00	1.41E 00	9.70E-01	7.10E-01	5.43E-01	4.29E-01	3.47E-01	2.85E-01	2.38E-01
3	0.00562	2.70E 01	8.89E 00	4.05E 00	2.24E 00	1.41E 00	9.71E-01	7.11E-01	5.43E-01	4.29E-01	3.47E-01	2.85E-01	2.38E-01
2	0.00156	2.70E 01	8.89E 00	4.05E 00	2.24E 00	1.41E 00	9.71E-01	7.11E-01	5.44E-01	4.29E-01	3.47E-01	2.86E-01	2.38E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.18E 00	2.30E 00	2.27E 00	2.11E 00	1.88E 00	1.63E 00	1.38E 00	1.17E 00	9.87E-01	8.31E-01	2.70E 01	
19	0.05937	1.44E 01	1.51E 01	1.47E 01	1.36E 01	1.20E 01	1.02E 01	8.56E 00	7.10E 00	5.88E 00	4.88E 00	2.70E 01	
18	0.05594	2.19E 01	2.27E 01	2.21E 01	2.02E 01	1.77E 01	1.51E 01	1.26E 01	1.04E 01	8.57E 00	7.11E 00	2.70E 01	
17	0.05344	2.64E 01	2.72E 01	2.63E 01	2.40E 01	2.10E 01	1.78E 01	1.47E 01	1.21E 01	9.98E 00	8.28E 00	2.70E 01	
16	0.05078	3.09E 01	3.17E 01	3.05E 01	2.77E 01	2.42E 01	2.04E 01	1.68E 01	1.37E 01	1.13E 01	9.36E 00	2.70E 01	
15	0.04812	3.53E 01	3.60E 01	3.44E 01	3.12E 01	2.71E 01	2.28E 01	1.87E 01	1.53E 01	1.25E 01	1.03E 01	2.70E 01	
14	0.04562	3.91E 01	3.97E 01	3.79E 01	3.43E 01	2.98E 01	2.50E 01	2.04E 01	1.66E 01	1.35E 01	1.12E 01	2.70E 01	
13	0.04328	4.22E 01	4.28E 01	4.08E 01	3.70E 01	3.21E 01	2.69E 01	2.19E 01	1.77E 01	1.44E 01	1.19E 01	2.70E 01	
12	0.04094	4.48E 01	4.53E 01	4.33E 01	3.94E 01	3.42E 01	2.87E 01	2.33E 01	1.88E 01	1.53E 01	1.26E 01	2.70E 01	
11	0.03719	4.68E 01	4.75E 01	4.58E 01	4.21E 01	3.69E 01	3.11E 01	2.53E 01	2.04E 01	1.65E 01	1.35E 01	2.70E 01	
10	0.03437	4.63E 01	4.74E 01	4.63E 01	4.31E 01	3.83E 01	3.25E 01	2.66E 01	2.14E 01	1.73E 01	1.42E 01	2.70E 01	
9	0.03219	4.42E 01	4.60E 01	4.57E 01	4.32E 01	3.89E 01	3.33E 01	2.74E 01	2.21E 01	1.78E 01	1.46E 01	2.70E 01	
8	0.03031	4.09E 01	4.36E 01	4.43E 01	4.27E 01	3.90E 01	3.37E 01	2.79E 01	2.26E 01	1.83E 01	1.50E 01	2.70E 01	
7	0.02687	3.14E 01	3.65E 01	3.98E 01	4.03E 01	3.82E 01	3.39E 01	2.86E 01	2.33E 01	1.89E 01	1.55E 01	2.70E 01	
6	0.02187	1.51E 01	2.24E 01	2.91E 01	3.35E 01	3.47E 01	3.28E 01	2.86E 01	2.39E 01	1.95E 01	1.60E 01	2.70E 01	
5	0.01625	3.95E 00	9.21E 00	1.63E 01	2.34E 01	2.83E 01	2.96E 01	2.76E 01	2.38E 01	1.98E 01	1.63E 01	2.70E 01	
4	0.01062	5.43E-01	2.56E 00	7.26E 00	1.42E 01	2.12E 01	2.56E 01	2.59E 01	2.34E 01	1.98E 01	1.65E 01	2.70E 01	
3	0.00562	2.01E-01	4.96E-01	2.90E 00	8.54E 00	1.64E 01	2.27E 01	2.46E 01	2.29E 01	1.98E 01	1.65E 01	2.70E 01	
2	0.00156	2.01E-01	1.78E-01	1.34E 00	6.45E 00	1.45E 01	2.15E 01	2.40E 01	2.27E 01	1.97E 01	1.65E 01	2.70E 01	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	2.53E 01	1.34E 02	2.61E 02	4.31E 02	6.56E 02	9.48E 02	1.31E 03	1.70E 03
19	0.05937	0.00	0.00	0.00	0.00	7.37E 01	2.14E 02	3.61E 02	5.62E 02	8.24E 02	1.15E 03	1.52E 03	1.90E 03
18	0.05594	0.00	0.00	0.00	0.00	1.07E 02	2.93E 02	5.10E 02	8.09E 02	1.19E 03	1.65E 03	2.15E 03	2.61E 03
17	0.05344	0.00	0.00	0.00	5.87E 01	1.41E 02	3.44E 02	6.35E 02	1.04E 03	1.56E 03	2.16E 03	2.81E 03	3.35E 03
16	0.05078	0.00	0.00	0.00	7.34E 01	1.69E 02	4.06E 02	8.05E 02	1.37E 03	2.07E 03	2.87E 03	3.69E 03	4.34E 03
15	0.04812	0.00	0.00	0.00	8.67E 01	1.99E 02	5.10E 02	1.07E 03	1.84E 03	2.76E 03	3.78E 03	4.78E 03	5.51E 03
14	0.04562	0.00	0.00	6.04E 01	1.12E 02	2.63E 02	7.47E 02	1.53E 03	2.53E 03	3.67E 03	4.88E 03	6.01E 03	6.76E 03
13	0.04328	0.00	0.00	1.03E 02	1.83E 02	5.41E 02	1.34E 03	2.36E 03	3.55E 03	4.84E 03	6.16E 03	7.33E 03	8.02E 03
12	0.04094	0.00	0.00	1.95E 02	7.03E 02	1.82E 03	2.81E 03	3.91E 03	5.13E 03	6.44E 03	7.73E 03	8.80E 03	9.32E 03
11	0.03719	0.00	7.56E 02	5.14E 03	8.75E 03	8.57E 03	8.24E 03	8.34E 03	8.82E 03	9.54E 03	1.03E 04	1.09E 04	1.10E 04
10	0.03437	0.00	4.95E 03	3.68E 04	3.07E 04	2.33E 04	1.82E 04	1.51E 04	1.34E 04	1.27E 04	1.24E 04	1.22E 04	1.16E 04
9	0.03219	0.00	6.28E 04	8.44E 04	6.07E 04	3.97E 04	2.67E 04	1.96E 04	1.61E 04	1.42E 04	1.30E 04	1.21E 04	1.12E 04

[illegible]

X 1.00 0.....+.....+.....+.....2.+.....+.....4.....+.....+.....6.....+.....8.....+.....1 1.00
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

DIMENSIONLESS STREAMLINE PLOT

OITER NO	I--- UMON	ABSOLUTE VMON	RESIDUAL WMON	SOURCE SUMS MASS	TKIN	DISP	U	V	W	P	D
1	0.3029E-02	0.6447E-03	0.9868E 00	0.5894E-04	0.2329E-01	0.3545E 11	0.8722E 01	-0.5813E-03	0.2563E-08	0.2010E 03	0.4750E 03
2	0.5488E-02	0.2432E 00	0.9763E 00	0.1732E 00	0.3818E-01	0.5890E 11	0.8720E 01	-0.5188E-03	0.3109E-07	0.7755E 03	0.4732E 03
3	0.1457E 00	0.3522E 00	0.9498E 00	0.2481E 00	0.3747E-01	0.4344E 11	0.8718E 01	-0.4637E-03	0.1972E-06	0.1405E 04	0.4715E 03
4	0.3280E 00	0.4279E 00	0.9113E 00	0.4365E 00	0.4430E-01	0.1527E 11	0.8716E 01	-0.4334E-03	0.8697E-06	0.1719E 04	0.4698E 03
5	0.4778E 00	0.5016E 00	0.8724E 00	0.4410E 00	0.6300E-01	0.1517E 11	0.8714E 01	-0.4706E-03	0.2997E-05	0.1850E 04	0.4632E 03
6	0.6442E 00	0.5617E 00	0.8366E 00	0.6706E 00	0.7683E-01	0.1509E 11	0.8713E 01	-0.6050E-03	0.8595E-05	0.1894E 04	0.4667E 03
7	0.7738E 00	0.6117E 00	0.8133E 00	0.8115E 00	0.9205E-01	0.1024E 11	0.8711E 01	-0.8027E-03	0.2137E-04	0.1862E 04	0.4653E 03
8	0.8779E 00	0.6951E 00	0.7823E 00	0.1347E 01	0.1043E 00	0.5478E 10	0.8710E 01	-0.9868E-03	0.4740E-04	0.1786E 04	0.4639E 03
9	0.9731E 00	0.6582E 00	0.7617E 00	0.1584E 01	0.1177E 00	0.3815E 10	0.8709E 01	-0.1075E-02	0.9590E-04	0.1704E 04	0.4625E 03
10	0.1095E 01	0.7800E 00	0.7880E 00	0.4551E 01	0.1284E 00	0.5636E 10	0.8707E 01	-0.1057E-02	0.1800E-03	0.1622E 04	0.4612E 03
11	0.1238E 01	0.7418E 00	0.7692E 00	0.2557E 01	0.1278E 00	0.4809E 10	0.8706E 01	-0.9721E-03	0.3176E-03	0.1526E 04	0.4599E 03
12	0.1349E 01	0.8058E 00	0.8207E 00	0.3906E 01	0.1260E 00	0.2741E 10	0.8704E 01	-0.8417E-03	0.5325E-03	0.1451E 04	0.4586E 03
13	0.1472E 01	0.9406E 00	0.7405E 00	0.2596E 01	0.1231E 00	0.1276E 10	0.8702E 01	-0.6344E-03	0.8544E-03	0.1449E 04	0.4573E 03
14	0.1392E 01	0.6632E 00	0.7431E 00	0.1909E 01	0.1164E 00	0.3185E 10	0.8700E 01	-0.5685E-03	0.1319E-02	0.1372E 04	0.4560E 03
15	0.1273E 01	0.6962E 00	0.7222E 00	0.1834E 01	0.1197E 00	0.6314E 10	0.8697E 01	-0.5166E-03	0.1964E-02	0.1380E 04	0.4547E 03
16	0.1167E 01	0.5735E 00	0.7127E 00	0.1849E 01	0.1194E 00	0.6994E 10	0.8694E 01	-0.6730E-03	0.2829E-02	0.1405E 04	0.4535E 03
17	0.1082E 01	0.5374E 00	0.7001E 00	0.1612E 01	0.1245E 00	0.6445E 10	0.8691E 01	-0.1004E-02	0.3946E-02	0.1366E 04	0.4523E 03
18	0.1019E 01	0.5202E 00	0.6834E 00	0.1234E 01	0.1293E 00	0.7175E 10	0.8688E 01	-0.1540E-02	0.5341E-02	0.1370E 04	0.4511E 03
19	0.9717E 00	0.3852E 00	0.6718E 00	0.7121E 00	0.1332E 00	0.7542E 10	0.8684E 01	-0.2090E-02	0.7023E-02	0.1319E 04	0.4498E 03
20	0.9476E 00	0.4252E 00	0.6627E 00	0.6301E 00	0.1387E 00	0.8101E 10	0.8680E 01	-0.2702E-02	0.8991E-02	0.1280E 04	0.4485E 03
21	0.9360E 00	0.3482E 00	0.6541E 00	0.4841E 00	0.1395E 00	0.8166E 10	0.8676E 01	-0.3197E-02	0.1123E-01	0.1231E 04	0.4471E 03
22	0.9484E 00	0.3962E 00	0.6458E 00	0.6058E 00	0.1407E 00	0.7614E 10	0.8672E 01	-0.3723E-02	0.1371E-01	0.1177E 04	0.4456E 03
23	0.9545E 00	0.3465E 00	0.6320E 00	0.4842E 00	0.1408E 00	0.6907E 10	0.8667E 01	-0.4170E-02	0.1641E-01	0.1140E 04	0.4439E 03
24	0.9593E 00	0.3840E 00	0.6216E 00	0.4836E 00	0.1396E 00	0.7024E 10	0.8663E 01	-0.4617E-02	0.1929E-01	0.1107E 04	0.4421E 03
25	0.9444E 00	0.3683E 00	0.6103E 00	0.4421E 00	0.1387E 00	0.7020E 10	0.8658E 01	-0.5117E-02	0.2231E-01	0.1093E 04	0.4401E 03
26	0.9276E 00	0.4004E 00	0.6026E 00	0.4157E 00	0.1372E 00	0.6778E 10	0.8653E 01	-0.5579E-02	0.2544E-01	0.1080E 04	0.4380E 03
27	0.9033E 00	0.3671E 00	0.5971E 00	0.3950E 00	0.1362E 00	0.6360E 10	0.8649E 01	-0.6147E-02	0.2866E-01	0.1073E 04	0.4356E 03
28	0.8839E 00	0.3874E 00	0.5909E 00	0.3806E 00	0.1343E 00	0.6029E 10	0.8644E 01	-0.6614E-02	0.3193E-01	0.1062E 04	0.4331E 03
29	0.8645E 00	0.3645E 00	0.5851E 00	0.3662E 00	0.1317E 00	0.5818E 10	0.8639E 01	-0.7226E-02	0.3524E-01	0.1054E 04	0.4304E 03
30	0.8525E 00	0.3842E 00	0.5798E 00	0.3516E 00	0.1283E 00	0.5640E 10	0.8633E 01	-0.7671E-02	0.3857E-01	0.1042E 04	0.4276E 03
31	0.8403E 00	0.3587E 00	0.5756E 00	0.3484E 00	0.1251E 00	0.5537E 10	0.8628E 01	-0.8238E-02	0.4191E-01	0.1029E 04	0.4246E 03
32	0.8317E 00	0.3716E 00	0.5700E 00	0.3453E 00	0.1222E 00	0.5473E 10	0.8622E 01	-0.8585E-02	0.4525E-01	0.1015E 04	0.4214E 03
33	0.8267E 00	0.3390E 00	0.5651E 00	0.3259E 00	0.1189E 00	0.5417E 10	0.8616E 01	-0.9047E-02	0.4860E-01	0.1000E 04	0.4181E 03
34	0.8191E 00	0.3517E 00	0.5609E 00	0.3342E 00	0.1161E 00	0.5517E 10	0.8610E 01	-0.9295E-02	0.5194E-01	0.9863E 03	0.4147E 03
35	0.8107E 00	0.3319E 00	0.5573E 00	0.3279E 00	0.1139E 00	0.5626E 10	0.8603E 01	-0.9660E-02	0.5527E-01	0.9749E 03	0.4111E 03
36	0.8031E 00	0.3474E 00	0.5531E 00	0.3071E 00	0.1138E 00	0.6387E 10	0.8596E 01	-0.9831E-02	0.5860E-01	0.9672E 03	0.4075E 03
37	0.7959E 00	0.3196E 00	0.5485E 00	0.2942E 00	0.1138E 00	0.7340E 10	0.8589E 01	-0.1012E-01	0.6194E-01	0.9647E 03	0.4038E 03
38	0.7837E 00	0.3242E 00	0.5425E 00	0.3022E 00	0.1140E 00	0.7892E 10	0.8581E 01	-0.1024E-01	0.6528E-01	0.9639E 03	0.4000E 03
39	0.7727E 00	0.2954E 00	0.5361E 00	0.2974E 00	0.1135E 00	0.7968E 10	0.8573E 01	-0.1048E-01	0.6864E-01	0.9643E 03	0.3961E 03
40	0.7577E 00	0.3047E 00	0.5311E 00	0.3033E 00	0.1135E 00	0.7678E 10	0.8564E 01	-0.1059E-01	0.7201E-01	0.9654E 03	0.3922E 03
41	0.7495E 00	0.2796E 00	0.5263E 00	0.3061E 00	0.1128E 00	0.6972E 10	0.8555E 01	-0.1079E-01	0.7540E-01	0.9674E 03	0.3882E 03
42	0.7374E 00	0.2737E 00	0.5206E 00	0.2472E 00	0.1117E 00	0.5832E 10	0.8546E 01	-0.1087E-01	0.7883E-01	0.9680E 03	0.3842E 03
43	0.7273E 00	0.2521E 00	0.5162E 00	0.2415E 00	0.1109E 00	0.5224E 10	0.8536E 01	-0.1102E-01	0.8228E-01	0.9670E 03	0.3802E 03
44	0.7167E 00	0.2554E 00	0.5119E 00	0.2301E 00	0.1104E 00	0.4683E 10	0.8526E 01	-0.1107E-01	0.8578E-01	0.9655E 03	0.3762E 03
45	0.7071E 00	0.2290E 00	0.5084E 00	0.2088E 00	0.1095E 00	0.4099E 10	0.8516E 01	-0.1118E-01	0.8933E-01	0.9641E 03	0.3721E 03

O	J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	-1.82E-02	-2.06E-02	3.51E-03	1.67E-02	2.00E-02	1.92E-02	1.88E-02	2.03E-02	
19	0.05937	0.00	0.00	0.00	0.00	-1.52E-02	-2.03E-02	3.19E-03	1.57E-02	1.87E-02	1.80E-02	1.76E-02	1.94E-02	
18	0.05594	0.00	0.00	0.00	0.00	-8.45E-03	-1.82E-02	3.49E-03	1.50E-02	1.73E-02	1.63E-02	1.57E-02	1.77E-02	

0	J	Y												
11	1.00000	0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	0.00	2.37E-01	2.67E-01	3.23E-01	3.90E-01	4.45E-01	4.67E-01	4.74E-01	4.75E-01	4.75E-01	4.75E-01	4.75E-01	4.74E-01
9	0.80000	0.00	2.23E-01	2.47E-01	2.93E-01	3.56E-01	4.11E-01	4.40E-01	4.50E-01	4.52E-01	4.52E-01	4.51E-01	4.51E-01	4.51E-01
8	0.70000	0.00	2.09E-01	2.30E-01	2.70E-01	3.29E-01	3.83E-01	4.15E-01	4.27E-01	4.30E-01	4.29E-01	4.28E-01	4.28E-01	4.28E-01
7	0.60000	0.00	1.93E-01	2.13E-01	2.50E-01	3.05E-01	3.59E-01	3.92E-01	4.06E-01	4.09E-01	4.07E-01	4.06E-01	4.06E-01	4.06E-01
6	0.50000	0.00	1.77E-01	1.95E-01	2.31E-01	2.83E-01	3.36E-01	3.70E-01	3.85E-01	3.87E-01	3.85E-01	3.83E-01	3.83E-01	3.83E-01
5	0.40000	0.00	1.57E-01	1.76E-01	2.11E-01	2.62E-01	3.14E-01	3.49E-01	3.64E-01	3.66E-01	3.63E-01	3.60E-01	3.58E-01	3.58E-01
4	0.30000	0.00	1.36E-01	1.53E-01	1.89E-01	2.40E-01	2.92E-01	3.28E-01	3.43E-01	3.44E-01	3.40E-01	3.35E-01	3.32E-01	3.32E-01
3	0.20000	0.00	1.10E-01	1.29E-01	1.64E-01	2.17E-01	2.69E-01	3.05E-01	3.20E-01	3.20E-01	3.12E-01	3.05E-01	2.99E-01	2.99E-01
2	0.10000	0.00	7.75E-02	9.43E-02	1.33E-01	1.86E-01	2.43E-01	2.80E-01	2.94E-01	2.91E-01	2.78E-01	2.65E-01	2.54E-01	2.54E-01

MAXIMUM VALUES 0.260E 02 0.320E 02 0.366E 02 0.409E 02 0.455E 02 0.500E 02

		RADIAL POSITION 2R/D											
0		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
X	0.00	0.....+	.....+.	2.....+4.....	6+.....8.....	1.....	.....	.....	.....	.....	.....	.....	0.00
X	0.02	0		2	4	6	8	1					. 0.02
X	0.04	.	0		2	4	6	8		1			. 0.04
X	0.06	.		0		2	4	6	8		1		. 0.06
X	0.08	.			0		2	4	6	8		1	0.08
X	0.10	+					0	2	4	6	8	1	0.10
X	0.12	.					0		2	4	6	8	1 0.12
X	0.14	.					0		2	4	6	8	1 0.14
X	0.16	.											. 0.16
X	0.18	.				0		2	4	6	8	1	0.18
X	0.20	+										+	0.20
X	0.22	.				0		2	4	6	8	1	0.22
X	0.24	.											. 0.24
X	0.26	.			0			2	4	6	8	1	0.26
X	0.28	.											. 0.28
X	0.30	+		0				2	4	6	8	1	0.30
X	0.32	.											. 0.32
X	0.34	0						2	4	6	8	1	0.34
X	0.36	.											. 0.36
X	0.38	.											. 0.38
X	0.40	0						2	4	6	8	1	0.40
X	0.42	.											. 0.42
X	0.44	.											. 0.44
X	0.46	0						2	4	6	8	1	0.46

	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	10	11	12						
6	0.02187	2.22E 00	3.19E 00	4.00E 00	4.62E 00	5.07E 00	5.37E 00	5.58E 00	5.70E 00	5.75E 00	5.76E 00	5.75E 00													
5	0.01625	8.04E-01	1.99E 00	3.02E 00	3.82E 00	4.41E 00	4.83E 00	5.11E 00	5.28E 00	5.36E 00	5.38E 00	5.38E 00													
4	0.01062	-2.72E-01	1.08E 00	2.26E 00	3.21E 00	3.92E 00	4.42E 00	4.76E 00	4.97E 00	5.07E 00	5.10E 00	5.10E 00													
3	0.00562	-8.76E-01	5.61E-01	1.83E 00	2.87E 00	3.64E 00	4.18E 00	4.57E 00	4.79E 00	4.91E 00	4.94E 00	4.94E 00													
2	0.00156	-1.10E 00	3.73E-01	1.67E 00	2.74E 00	3.53E 00	4.10E 00	4.49E 00	4.73E 00	4.85E 00	4.89E 00	4.89E 00													
1	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00													
0	V VELOCITY																								
0	I =	1	2	3	4	5	6	7	8	9	10	11	12												
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552												
0	J	Y																							
21	0.06250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
20	0.06062	0.00	0.00	0.00	0.00	1.35E 00	8.24E-01	1.84E-01	-4.95E-02	-9.61E-02	-7.81E-02	-5.27E-02	-4.59E-02												
19	0.05766	0.00	0.00	0.00	0.00	4.23E 00	1.94E 00	4.33E-01	-1.36E-01	-2.50E-01	-2.15E-01	-1.76E-01	-1.58E-01												
18	0.05469	0.00	0.00	0.00	0.00	7.91E 00	2.84E 00	5.86E-01	-2.65E-01	-4.31E-01	-3.94E-01	-3.39E-01	-2.88E-01												
17	0.05211	0.00	0.00	0.00	4.32E 00	7.91E 00	3.34E 00	6.37E-01	-4.13E-01	-6.23E-01	-5.80E-01	-4.87E-01	-3.99E-01												
16	0.04945	0.00	0.00	0.00	8.41E 00	8.47E 00	3.75E 00	6.58E-01	-5.75E-01	-8.39E-01	-7.68E-01	-6.23E-01	-5.01E-01												
15	0.04687	0.00	0.00	0.00	1.26E 01	9.09E 00	4.00E 00	5.86E-01	-7.81E-01	-1.05E 00	-9.15E-01	-7.28E-01	-5.84E-01												
14	0.04445	0.00	0.00	4.82E 00	1.27E 01	9.47E 00	4.08E 00	4.03E-01	-1.01E 00	-1.20E 00	-1.01E 00	-8.00E-01	-6.47E-01												
13	0.04211	0.00	0.00	8.97E 00	1.34E 01	9.78E 00	4.01E 00	1.30E-01	-1.21E 00	-1.30E 00	-1.07E 00	-8.49E-01	-6.96E-01												
12	0.03906	0.00	0.00	1.46E 01	1.47E 01	1.00E 01	3.66E 00	-3.18E-01	-1.42E 00	-1.36E 00	-1.10E 00	-8.91E-01	-7.43E-01												
11	0.03578	0.00	5.49E 00	1.65E 01	1.60E 01	9.93E 00	2.71E 00	-8.36E-01	-1.47E 00	-1.33E 00	-1.09E 00	-9.03E-01	-7.67E-01												
10	0.03328	0.00	1.08E 01	1.81E 01	1.65E 01	9.40E 00	1.76E 00	-1.09E 00	-1.43E 00	-1.27E 00	-1.06E 00	-8.97E-01	-7.73E-01												
9	0.03125	0.00	1.64E 01	1.90E 01	1.65E 01	8.64E 00	9.81E-01	-1.19E 00	-1.36E 00	-1.21E 00	-1.03E 00	-8.83E-01	-7.69E-01												
8	0.02859	0.00	1.53E 01	1.93E 01	1.60E 01	7.32E 00	4.61E-02	-1.20E 00	-1.25E 00	-1.12E 00	-9.76E-01	-8.58E-01	-7.56E-01												
7	0.02437	0.00	1.45E 01	1.92E 01	1.47E 01	4.25E 00	-9.08E-01	-1.06E 00	-1.04E 00	-9.63E-01	-8.76E-01	-7.94E-01	-7.09E-01												
6	0.01906	0.00	1.44E 01	1.84E 01	1.12E 01	-3.18E-01	-8.84E-01	-8.18E-01	-7.80E-01	-7.59E-01	-7.23E-01	-6.73E-01	-6.08E-01												
5	0.01344	0.00	1.46E 01	1.61E 01	2.73E 00	-9.34E-01	-7.12E-01	-5.80E-01	-5.36E-01	-5.34E-01	-5.32E-01	-5.04E-01	-4.59E-01												
4	0.00812	0.00	1.39E 01	9.01E 00	-1.40E 00	-8.06E-01	-4.81E-01	-3.58E-01	-3.21E-01	-3.23E-01	-3.29E-01	-3.17E-01	-2.88E-01												
3	0.00359	0.00	9.68E 00	6.80E-01	-5.70E-01	-3.84E-01	-2.24E-01	-1.61E-01	-1.42E-01	-1.43E-01	-1.46E-01	-1.43E-01	-1.30E-01												
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
0	I =	13	14	15	16	17	18	19	20	21	22	23													
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127													
0	J	Y																							
21	0.06250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
20	0.06062	-4.44E-02	-3.60E-02	-2.46E-02	-1.51E-02	-9.10E-03	-5.77E-03	-3.56E-03	-2.27E-03	-3.54E-04	1.73E-04	0.00													
19	0.05766	-1.35E-01	-1.01E-01	-6.59E-02	-3.91E-02	-2.20E-02	-1.20E-02	-5.30E-03	-1.21E-03	2.50E-03	3.77E-04	0.00													
18	0.05469	-2.31E-01	-1.68E-01	-1.09E-01	-6.47E-02	-3.64E-02	-1.96E-02	-8.16E-03	-1.17E-03	4.35E-03	5.16E-04	0.00													
17	0.05211	-3.13E-01	-2.25E-01	-1.46E-01	-8.77E-02	-4.99E-02	-2.71E-02	-1.16E-02	-2.07E-03	5.10E-03	6.09E-04	0.00													
16	0.04945	-3.91E-01	-2.81E-01	-1.84E-01	-1.11E-01	-6.44E-02	-3.56E-02	-1.59E-02	-3.85E-03	5.08E-03	6.80E-04	0.00													
15	0.04687	-4.58E-01	-3.31E-01	-2.18E-01	-1.34E-01	-7.84E-02	-4.42E-02	-2.05E-02	-6.16E-03	4.49E-03	7.29E-04	0.00													
14	0.04445	-5.12E-01	-3.73E-01	-2.48E-01	-1.53E-01	-9.11E-02	-5.22E-02	-2.50E-02	-8.63E-03	3.58E-03	7.57E-04	0.00													
13	0.04211	-5.55E-01	-4.08E-01	-2.73E-01	-1.71E-01	-1.03E-01	-5.96E-02	-2.94E-02	-1.11E-02	2.49E-03	7.68E-04	0.00													
12	0.03906	-6.01E-01	-4.46E-01	-3.02E-01	-1.91E-01	-1.17E-01	-6.87E-02	-3.48E-02	-1.44E-02	9.02E-04	7.66E-04	0.00													
11	0.03578	-6.28E-01	-4.72E-01	-3.24E-01	-2.07E-01	-1.28E-01	-7.62E-02	-3.96E-02	-1.76E-02	8.17E-04	7.35E-04	0.00													
10	0.03328	-6.38E-01	-4.84E-01	-3.34E-01	-2.16E-01	-1.34E-01	-8.06E-02	-4.25E-02	-1.96E-02	2.03E-03	6.98E-04	0.00													
9	0.03125	-6.39E-01	-4.87E-01	-3.39E-01	-2.20E-01	-1.37E-01	-8.31E-02	-4.43E-02	-2.09E-02	2.92E-03	6.61E-04	0.00													
8	0.02859	-6.33E-01	-4.87E-01	-3.41E-01	-2.22E-01	-1.40E-01	-8.54E-02	-4.61E-02	-2.23E-02	3.96E-03	6.08E-04	0.00													
7	0.02437	-6.01E-01	-4.67E-01	-3.31E-01	-2.18E-01	-1.38E-01	-8.51E-02	-4.66E-02	-2.33E-02	5.15E-03	5.18E-04	0.00													
6	0.01906	-5.19E-01	-4.09E-01	-2.94E-01	-1.95E-01	-1.24E-01	-7.73E-02	-4.30E-02	-2.20E-02	5.63E-03	3.96E-04	0.00													
5	0.01344	-3.94E-01	-3.13E-01	-2.28E-01	-1.52E-01	-9.75E-02	-6.09E-02	-3.42E-02	-1.78E-02	4.95E-03	2.68E-04	0.00													
4	0.00812	-2.49E-01	-1.98E-01	-1.46E-01	-9.72E-02	-6.26E-02	-3.93E-02	-2.21E-02	-1.17E-02	3.38E-03	1.54E-04	0.00													
3	0.00359	-1.12E-01	-8.94E-02	-6.60E-02	-4.41E-02	-2.84E-02	-1.78E-02	-1.01E-02	-5.34E-03	1.58E-03	6.59E-05	0.00													
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												

[illegible]

153	0.6500E-01	0.9340E-02	0.5000E-02	0.5468E-03	0.1379E-01	0.1005E	08	0.9185E	01-0.1123E-01	0.0000	0.2007E	03	0.6642E	03
154	0.6210E-01	0.9059E-02	0.5000E-02	0.5379E-03	0.1346E-01	0.9947E	07	0.9164E	01-0.1080E-01	0.0000	0.2007E	03	0.6581E	03
155	0.5930E-01	0.8680E-02	0.5000E-02	0.4938E-03	0.1313E-01	0.9740E	07	0.9143E	01-0.1039E-01	0.0000	0.2008E	03	0.6520E	03
156	0.5659E-01	0.8412E-02	0.5000E-02	0.4847E-03	0.1280E-01	0.9768E	07	0.9123E	01-0.9986E-02	0.0000	0.2008E	03	0.6461E	03
157	0.5398E-01	0.8049E-02	0.5000E-02	0.4450E-03	0.1247E-01	0.9354E	07	0.9104E	01-0.9592E-02	0.0000	0.2008E	03	0.6402E	03
158	0.5147E-01	0.7791E-02	0.5000E-02	0.4407E-03	0.1214E-01	0.9029E	07	0.9086E	01-0.9210E-02	0.0000	0.2009E	03	0.6344E	03
159	0.4904E-01	0.7449E-02	0.5000E-02	0.3977E-03	0.1182E-01	0.9027E	07	0.9068E	01-0.8835E-02	0.0000	0.2009E	03	0.6287E	03
160	0.4670E-01	0.7194E-02	0.5000E-02	0.3943E-03	0.1149E-01	0.8612E	07	0.9051E	01-0.8472E-02	0.0000	0.2009E	03	0.6230E	03
161	0.4443E-01	0.6874E-02	0.5000E-02	0.3574E-03	0.1117E-01	0.8510E	07	0.9034E	01-0.8118E-02	0.0000	0.2010E	03	0.6175E	03
162	0.4227E-01	0.6627E-02	0.5000E-02	0.3549E-03	0.1085E-01	0.8430E	07	0.9018E	01-0.7773E-02	0.0000	0.2010E	03	0.6121E	03
163	0.4017E-01	0.6325E-02	0.5000E-02	0.3177E-03	0.1053E-01	0.8022E	07	0.9002E	01-0.7438E-02	0.0000	0.2010E	03	0.6067E	03
164	0.3815E-01	0.6088E-02	0.5000E-02	0.3181E-03	0.1022E-01	0.7807E	07	0.8988E	01-0.7113E-02	0.0000	0.2010E	03	0.6014E	03
165	0.3622E-01	0.5804E-02	0.5000E-02	0.2833E-03	0.9909E-02	0.7839E	07	0.8973E	01-0.6796E-02	0.0000	0.2010E	03	0.5963E	03
166	0.3436E-01	0.5581E-02	0.5000E-02	0.2817E-03	0.9604E-02	0.7543E	07	0.8959E	01-0.6488E-02	0.0000	0.2011E	03	0.5912E	03
167	0.3258E-01	0.5308E-02	0.5000E-02	0.2544E-03	0.9302E-02	0.7539E	07	0.8946E	01-0.6190E-02	0.0000	0.2011E	03	0.5863E	03
168	0.3087E-01	0.5099E-02	0.5000E-02	0.2492E-03	0.9005E-02	0.7138E	07	0.8933E	01-0.5900E-02	0.0000	0.2011E	03	0.5814E	03
169	0.2922E-01	0.4843E-02	0.5000E-02	0.2282E-03	0.8714E-02	0.7188E	07	0.8921E	01-0.5620E-02	0.0000	0.2011E	03	0.5766E	03
170	0.2765E-01	0.4642E-02	0.5000E-02	0.2232E-03	0.8426E-02	0.6757E	07	0.8909E	01-0.5349E-02	0.0000	0.2011E	03	0.5720E	03
171	0.2615E-01	0.4405E-02	0.5000E-02	0.2029E-03	0.8145E-02	0.6697E	07	0.8898E	01-0.5086E-02	0.0000	0.2011E	03	0.5674E	03
172	0.2471E-01	0.4217E-02	0.5000E-02	0.2003E-03	0.7868E-02	0.6536E	07	0.8887E	01-0.4831E-02	0.0000	0.2011E	03	0.5630E	03
173	0.2333E-01	0.3989E-02	0.5000E-02	0.1762E-03	0.7598E-02	0.6100E	07	0.8877E	01-0.4586E-02	0.0000	0.2011E	03	0.5586E	03
174	0.2201E-01	0.3816E-02	0.5000E-02	0.1769E-03	0.7332E-02	0.6124E	07	0.8867E	01-0.4348E-02	0.0000	0.2011E	03	0.5543E	03
175	0.2075E-01	0.3601E-02	0.5000E-02	0.1565E-03	0.7072E-02	0.5740E	07	0.8857E	01-0.4119E-02	0.0000	0.2011E	03	0.5502E	03
176	0.1955E-01	0.3440E-02	0.5000E-02	0.1576E-03	0.6817E-02	0.5787E	07	0.8848E	01-0.3897E-02	0.0000	0.2011E	03	0.5461E	03
177	0.1840E-01	0.3242E-02	0.5000E-02	0.1403E-03	0.6570E-02	0.5513E	07	0.8839E	01-0.3683E-02	0.0000	0.2011E	03	0.5422E	03
178	0.1730E-01	0.3090E-02	0.5000E-02	0.1433E-03	0.6328E-02	0.5520E	07	0.8831E	01-0.3478E-02	0.0000	0.2011E	03	0.5383E	03
179	0.1626E-01	0.2907E-02	0.5000E-02	0.1271E-03	0.6091E-02	0.5040E	07	0.8823E	01-0.3281E-02	0.0000	0.2011E	03	0.5346E	03
180	0.1526E-01	0.2765E-02	0.5000E-02	0.1234E-03	0.5862E-02	0.4882E	07	0.8815E	01-0.3090E-02	0.0000	0.2011E	03	0.5309E	03
181	0.1431E-01	0.2591E-02	0.5000E-02	0.1133E-03	0.5637E-02	0.4957E	07	0.8808E	01-0.2908E-02	0.0000	0.2011E	03	0.5274E	03
182	0.1341E-01	0.2465E-02	0.5000E-02	0.1089E-03	0.5418E-02	0.4687E	07	0.8801E	01-0.2733E-02	0.0000	0.2011E	03	0.5239E	03
183	0.1255E-01	0.2306E-02	0.5000E-02	0.9695E-04	0.5206E-02	0.4625E	07	0.8794E	01-0.2565E-02	0.0000	0.2011E	03	0.5205E	03
184	0.1174E-01	0.2186E-02	0.5000E-02	0.1013E-03	0.5001E-02	0.4629E	07	0.8788E	01-0.2404E-02	0.0000	0.2011E	03	0.5173E	03
185	0.1096E-01	0.2038E-02	0.5000E-02	0.8324E-04	0.4799E-02	0.4128E	07	0.8782E	01-0.2250E-02	0.0000	0.2011E	03	0.5141E	03
186	0.1023E-01	0.1932E-02	0.5000E-02	0.8520E-04	0.4604E-02	0.3983E	07	0.8777E	01-0.2102E-02	0.0000	0.2011E	03	0.5110E	03
187	0.9530E-02	0.1796E-02	0.5000E-02	0.7688E-04	0.4416E-02	0.3842E	07	0.8771E	01-0.1961E-02	0.0000	0.2011E	03	0.5080E	03
188	0.8877E-02	0.1697E-02	0.5000E-02	0.7644E-04	0.4232E-02	0.3895E	07	0.8766E	01-0.1826E-02	0.0000	0.2011E	03	0.5051E	03
189	0.8248E-02	0.1571E-02	0.5000E-02	0.6637E-04	0.4055E-02	0.3539E	07	0.8761E	01-0.1698E-02	0.0000	0.2011E	03	0.5023E	03
190	0.7658E-02	0.1483E-02	0.5000E-02	0.7093E-04	0.3882E-02	0.3405E	07	0.8757E	01-0.1576E-02	0.0000	0.2011E	03	0.4996E	03
191	0.7099E-02	0.1368E-02	0.5000E-02	0.5997E-04	0.3716E-02	0.3515E	07	0.8753E	01-0.1460E-02	0.0000	0.2011E	03	0.4970E	03
192	0.6572E-02	0.1288E-02	0.5000E-02	0.6507E-04	0.3555E-02	0.3264E	07	0.8749E	01-0.1348E-02	0.0000	0.2011E	03	0.4944E	03
193	0.6075E-02	0.1184E-02	0.5000E-02	0.5629E-04	0.3400E-02	0.3271E	07	0.8745E	01-0.1244E-02	0.0000	0.2011E	03	0.4919E	03
194	0.5604E-02	0.1114E-02	0.5000E-02	0.5987E-04	0.3249E-02	0.3039E	07	0.8741E	01-0.1143E-02	0.0000	0.2011E	03	0.4895E	03
195	0.5164E-02	0.1014E-02	0.5000E-02	0.5340E-04	0.3104E-02	0.2816E	07	0.8738E	01-0.1049E-02	0.0000	0.2010E	03	0.4872E	03
196	0.4750E-02	0.9538E-03	0.5000E-02	0.6175E-04	0.2965E-02	0.2716E	07	0.8735E	01-0.9598E-03	0.0000	0.2010E	03	0.4850E	03
197	0.4357E-02	0.8722E-03	0.5000E-02	0.5764E-04	0.2829E-02	0.2791E	07	0.8732E	01-0.8750E-03	0.0000	0.2010E	03	0.4829E	03
198	0.3991E-02	0.8131E-03	0.5000E-02	0.5925E-04	0.2699E-02	0.2487E	07	0.8729E	01-0.7952E-03	0.0000	0.2010E	03	0.4808E	03
199	0.3648E-02	0.7468E-03	0.5000E-02	0.6238E-04	0.2574E-02	0.2625E	07	0.8726E	01-0.7192E-03	0.0000	0.2010E	03	0.4788E	03
200	0.3326E-02	0.6953E-03	0.5000E-02	0.5878E-04	0.2453E-02	0.2379E	07	0.8724E	01-0.6489E-03	0.0000	0.2010E	03	0.4768E	03

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SWIRL CASE WITH LFS = 1
AND NSBR = 0

8	0.03031	4.49E 05	9.90E 04	3.74E 04	2.11E 04	1.64E 04	1.54E 04	1.52E 04	1.45E 04	1.31E 04	1.16E 04	1.07E 04	1.00E 04
7	0.02687	4.49E 05	8.07E 04	2.12E 04	7.29E 03	3.21E 03	1.85E 03	1.40E 03	1.39E 03	1.97E 03	3.08E 03	4.44E 03	5.58E 03
6	0.02187	4.49E 05	8.07E 04	2.12E 04	7.24E 03	3.00E 03	1.44E 03	7.66E 02	4.49E 02	3.09E 02	2.64E 02	3.35E 02	8.03E 02
5	0.01625	4.49E 05	8.07E 04	2.12E 04	7.26E 03	3.01E 03	1.44E 03	7.67E 02	4.41E 02	2.70E 02	1.73E 02	1.23E 02	1.10E 02
4	0.01062	4.49E 05	8.07E 04	2.12E 04	7.27E 03	3.02E 03	1.44E 03	7.68E 02	4.42E 02	2.70E 02	1.73E 02	1.15E 02	7.80E 01
3	0.00562	4.49E 05	8.07E 04	2.13E 04	7.27E 03	3.02E 03	1.44E 03	7.69E 02	4.43E 02	2.70E 02	1.73E 02	1.15E 02	7.80E 01
2	0.00156	4.49E 05	8.07E 04	2.13E 04	7.27E 03	3.02E 03	1.45E 03	7.69E 02	4.43E 02	2.71E 02	1.73E 02	1.15E 02	7.81E 01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.03E 03	2.19E 03	2.15E 03	1.93E 03	1.62E 03	1.31E 03	1.02E 03	7.93E 02	6.16E 02	4.77E 02	4.49E 05	
19	0.05937	2.18E 03	2.27E 03	2.15E 03	1.88E 03	1.54E 03	1.22E 03	9.41E 02	7.21E 02	5.55E 02	4.28E 02	4.49E 05	
18	0.05594	2.88E 03	2.87E 03	2.61E 03	2.18E 03	1.74E 03	1.33E 03	9.98E 02	7.48E 02	5.64E 02	4.31E 02	4.49E 05	
17	0.05344	3.63E 03	3.52E 03	3.11E 03	2.55E 03	1.98E 03	1.48E 03	1.09E 03	8.01E 02	5.96E 02	4.50E 02	4.49E 05	
16	0.05078	4.59E 03	4.36E 03	3.77E 03	3.02E 03	2.30E 03	1.69E 03	1.22E 03	8.78E 02	6.42E 02	4.80E 02	4.49E 05	
15	0.04812	5.71E 03	5.31E 03	4.52E 03	3.57E 03	2.68E 03	1.93E 03	1.36E 03	9.69E 02	6.98E 02	5.16E 02	4.49E 05	
14	0.04562	6.85E 03	6.28E 03	5.27E 03	4.13E 03	3.06E 03	2.18E 03	1.52E 03	1.06E 03	7.56E 02	5.54E 02	4.49E 05	
13	0.04328	7.97E 03	7.20E 03	5.99E 03	4.66E 03	3.43E 03	2.42E 03	1.67E 03	1.16E 03	8.13E 02	5.91E 02	4.49E 05	
12	0.04094	9.05E 03	8.07E 03	6.67E 03	5.16E 03	3.79E 03	2.66E 03	1.82E 03	1.25E 03	8.71E 02	6.28E 02	4.49E 05	
11	0.03719	1.03E 04	9.08E 03	7.49E 03	5.83E 03	4.30E 03	3.02E 03	2.05E 03	1.39E 03	9.62E 02	6.86E 02	4.49E 05	
10	0.03437	1.07E 04	9.36E 03	7.79E 03	6.14E 03	4.58E 03	3.24E 03	2.21E 03	1.49E 03	1.03E 03	7.28E 02	4.49E 05	
9	0.03219	1.03E 04	9.13E 03	7.74E 03	6.21E 03	4.71E 03	3.36E 03	2.31E 03	1.56E 03	1.07E 03	7.58E 02	4.49E 05	
8	0.03031	9.38E 03	8.57E 03	7.47E 03	6.14E 03	4.75E 03	3.44E 03	2.37E 03	1.61E 03	1.10E 03	7.80E 02	4.49E 05	
7	0.02687	6.34E 03	6.64E 03	6.39E 03	5.66E 03	4.62E 03	3.47E 03	2.45E 03	1.68E 03	1.15E 03	8.15E 02	4.49E 05	
6	0.02187	1.78E 03	2.94E 03	3.87E 03	4.22E 03	3.96E 03	3.26E 03	2.43E 03	1.72E 03	1.20E 03	8.51E 02	4.49E 05	
5	0.01625	2.03E 02	6.52E 02	1.47E 03	2.32E 03	2.80E 03	2.72E 03	2.25E 03	1.69E 03	1.21E 03	8.70E 02	4.49E 05	
4	0.01062	6.56E 01	1.02E 02	3.94E 02	1.02E 03	1.74E 03	2.10E 03	1.98E 03	1.60E 03	1.20E 03	8.72E 02	4.49E 05	
3	0.00562	5.42E 01	4.65E 01	1.09E 02	4.74E 02	1.13E 03	1.67E 03	1.76E 03	1.52E 03	1.17E 03	8.67E 02	4.49E 05	
2	0.00156	5.43E 01	3.87E 01	4.81E 01	2.58E 02	8.10E 02	1.40E 03	1.61E 03	1.45E 03	1.15E 03	8.60E 02	4.49E 05	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	1.00E 00	1.01E 00	1.01E 00	1.01E 00	1.01E 00	1.01E 00	1.01E 00
19	0.05937	0.00	0.00	0.00	0.00	0.00	1.03E 00	1.04E 00	1.05E 00	1.06E 00	1.06E 00	1.06E 00	1.06E 00
18	0.05594	0.00	0.00	0.00	0.00	0.00	1.05E 00	1.08E 00	1.10E 00	1.11E 00	1.11E 00	1.11E 00	1.11E 00
17	0.05344	0.00	0.00	0.00	0.00	1.01E 00	1.07E 00	1.11E 00	1.13E 00	1.14E 00	1.14E 00	1.14E 00	1.13E 00
16	0.05078	0.00	0.00	0.00	0.00	1.03E 00	1.09E 00	1.13E 00	1.15E 00	1.16E 00	1.17E 00	1.16E 00	1.15E 00
15	0.04812	0.00	0.00	0.00	0.00	1.05E 00	1.10E 00	1.14E 00	1.16E 00	1.17E 00	1.18E 00	1.17E 00	1.15E 00
14	0.04562	0.00	0.00	0.00	1.01E 00	1.06E 00	1.11E 00	1.15E 00	1.17E 00	1.18E 00	1.18E 00	1.17E 00	1.14E 00
13	0.04328	0.00	0.00	0.00	1.03E 00	1.07E 00	1.12E 00	1.14E 00	1.16E 00	1.17E 00	1.16E 00	1.15E 00	1.12E 00
12	0.04094	0.00	0.00	0.00	1.04E 00	1.08E 00	1.11E 00	1.13E 00	1.14E 00	1.15E 00	1.14E 00	1.12E 00	1.09E 00
11	0.03719	0.00	0.00	1.02E 00	1.06E 00	1.07E 00	1.09E 00	1.09E 00	1.09E 00	1.09E 00	1.07E 00	1.05E 00	1.01E 00
10	0.03437	0.00	0.00	1.03E 00	1.04E 00	1.04E 00	1.04E 00	1.03E 00	1.03E 00	1.02E 00	1.00E 00	9.75E-01	9.38E-01
9	0.03219	0.00	0.00	1.00E 00	9.94E-01	9.85E-01	9.77E-01	9.68E-01	9.59E-01	9.46E-01	9.29E-01	9.03E-01	8.68E-01
8	0.03031	0.00	9.41E-01	9.28E-01	9.18E-01	9.10E-01	9.03E-01	8.95E-01	8.86E-01	8.74E-01	8.57E-01	8.33E-01	8.00E-01
7	0.02687	0.00	7.40E-01	7.37E-01	7.35E-01	7.33E-01	7.31E-01	7.29E-01	7.25E-01	7.17E-01	7.05E-01	6.88E-01	6.63E-01
6	0.02187	0.00	4.90E-01	4.89E-01	4.87E-01	4.86E-01	4.86E-01	4.85E-01	4.84E-01	4.82E-01	4.77E-01	4.70E-01	4.58E-01
5	0.01625	0.00	2.70E-01	2.70E-01	2.69E-01	2.69E-01	2.68E-01	2.68E-01	2.67E-01	2.66E-01	2.64E-01	2.61E-01	2.56E-01
4	0.01062	0.00	1.16E-01	1.15E-01	1.15E-01	1.15E-01	1.15E-01	1.15E-01	1.14E-01	1.14E-01	1.13E-01	1.11E-01	1.10E-01

6	0.17500	1.68E-02	2.49E-02	3.23E-02	3.73E-02	3.86E-02	3.64E-02	3.18E-02	2.65E-02	2.17E-02	1.78E-02	3.00E-02	
5	0.13000	4.39E-03	1.02E-02	1.81E-02	2.60E-02	3.14E-02	3.29E-02	3.06E-02	2.65E-02	2.20E-02	1.82E-02	3.00E-02	
4	0.08500	6.03E-04	2.85E-03	8.06E-03	1.58E-02	2.36E-02	2.84E-02	2.88E-02	2.60E-02	2.20E-02	1.83E-02	3.00E-02	
3	0.04500	2.23E-04	5.51E-04	3.22E-03	9.49E-03	1.82E-02	2.52E-02	2.73E-02	2.55E-02	2.19E-02	1.84E-02	3.00E-02	
2	0.01250	2.23E-04	1.97E-04	1.49E-03	7.16E-03	1.61E-02	2.39E-02	2.67E-02	2.53E-02	2.19E-02	1.84E-02	3.00E-02	
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0*-**--*-**--*-**--*-**--*-**--*-**--*-**--*-**--*-**--*-**--*-**--*-**--*-**--*-**--*-**--*													
0	I =	2	3	4	5	6	7	8	9	10	11	12	13
J	X =	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552	0.15786
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	3.04E-01	3.22E-01	3.37E-01	3.49E-01	3.62E-01	3.76E-01	3.89E-01	4.01E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	3.85E-01	4.12E-01	4.33E-01	4.53E-01	4.76E-01	5.04E-01	5.34E-01	5.68E-01
17	0.05344	0.00	0.00	5.10E-02	2.66E-01	4.01E-01	4.21E-01	4.39E-01	4.59E-01	4.85E-01	5.17E-01	5.54E-01	5.98E-01
16	0.05078	0.00	0.00	1.78E-01	3.12E-01	3.98E-01	4.07E-01	4.23E-01	4.44E-01	4.71E-01	5.06E-01	5.49E-01	6.00E-01
15	0.04812	0.00	0.00	1.78E-01	3.32E-01	3.72E-01	3.75E-01	3.92E-01	4.15E-01	4.46E-01	4.84E-01	5.32E-01	5.88E-01
14	0.04562	0.00	5.10E-02	2.23E-01	3.25E-01	3.24E-01	3.32E-01	3.54E-01	3.83E-01	4.16E-01	4.59E-01	5.10E-01	5.70E-01
13	0.04328	0.00	1.60E-01	2.64E-01	2.69E-01	2.67E-01	2.88E-01	3.16E-01	3.49E-01	3.87E-01	4.32E-01	4.87E-01	5.51E-01
12	0.04094	0.00	1.60E-01	2.37E-01	2.07E-01	2.24E-01	2.49E-01	2.80E-01	3.16E-01	3.56E-01	4.04E-01	4.63E-01	5.30E-01
11	0.03719	7.64E-02	1.18E-01	1.53E-01	1.67E-01	1.82E-01	2.03E-01	2.31E-01	2.66E-01	3.07E-01	3.60E-01	4.23E-01	4.96E-01
10	0.03437	1.60E-01	1.35E-01	1.36E-01	1.40E-01	1.50E-01	1.68E-01	1.94E-01	2.28E-01	2.70E-01	3.25E-01	3.94E-01	4.72E-01
9	0.03219	1.60E-01	1.14E-01	1.08E-01	1.11E-01	1.23E-01	1.44E-01	1.71E-01	2.03E-01	2.45E-01	3.03E-01	3.74E-01	4.57E-01
8	0.03031	8.22E-03	1.83E-02	3.98E-02	7.22E-02	1.06E-01	1.34E-01	1.58E-01	1.86E-01	2.29E-01	2.90E-01	3.63E-01	4.47E-01
7	0.02687	5.26E-03	6.13E-03	7.54E-03	1.07E-02	2.04E-02	4.93E-02	1.22E-01	2.17E-01	2.88E-01	3.28E-01	3.71E-01	4.44E-01
6	0.02187	5.26E-03	6.13E-03	7.37E-03	8.88E-03	1.06E-02	1.25E-02	1.57E-02	2.89E-02	9.94E-02	3.58E-01	5.21E-01	5.29E-01
5	0.01625	5.26E-03	6.13E-03	7.37E-03	8.88E-03	1.06E-02	1.25E-02						

46	0.6925E	00	0.2280E	00	0.5048E	00	0.1976E	00	0.1081E	00	0.3631E	10	0.8505E	01-0.1121E-01	0.9293E-01	0.9615E	03	0.3680E	03	
47	0.6786E	00	0.2054E	00	0.5010E	00	0.1917E	00	0.1062E	00	0.3210E	10	0.8495E	01-0.1127E-01	0.9659E-01	0.9608E	03	0.3639E	03	
48	0.6614E	00	0.2040E	00	0.4989E	00	0.1857E	00	0.1043E	00	0.2895E	10	0.8483E	01-0.1129E-01	0.1003E	00	0.9606E	03	0.3598E	03
49	0.6449E	00	0.1847E	00	0.4972E	00	0.1850E	00	0.1020E	00	0.2728E	10	0.8472E	01-0.1133E-01	0.1041E	00	0.9606E	03	0.3557E	03
50	0.6235E	00	0.1837E	00	0.4947E	00	0.1756E	00	0.9925E-01	0.2562E	10	0.8460E	01-0.1134E-01	0.1080E	00	0.9605E	03	0.3515E	03	
51	0.6035E	00	0.1654E	00	0.4933E	00	0.1670E	00	0.9618E-01	0.2366E	10	0.8448E	01-0.1137E-01	0.1120E	00	0.9612E	03	0.3474E	03	
52	0.5807E	00	0.1651E	00	0.4912E	00	0.1675E	00	0.9316E-01	0.2113E	10	0.8435E	01-0.1137E-01	0.1162E	00	0.9609E	03	0.3432E	03	
53	0.5598E	00	0.1492E	00	0.4888E	00	0.1627E	00	0.8980E-01	0.1919E	10	0.8423E	01-0.1139E-01	0.1204E	00	0.9617E	03	0.3390E	03	
54	0.5378E	00	0.1486E	00	0.4865E	00	0.1574E	00	0.8618E-01	0.1785E	10	0.8410E	01-0.1140E-01	0.1248E	00	0.9615E	03	0.3349E	03	
55	0.5176E	00	0.1342E	00	0.4842E	00	0.1517E	00	0.8257E-01	0.1655E	10	0.8397E	01-0.1141E-01	0.1293E	00	0.9621E	03	0.3307E	03	
56	0.4968E	00	0.1348E	00	0.4819E	00	0.1498E	00	0.7885E-01	0.1528E	10	0.8383E	01-0.1143E-01	0.1340E	00	0.9618E	03	0.3266E	03	
57	0.4793E	00	0.1234E	00	0.4806E	00	0.1436E	00	0.7523E-01	0.1388E	10	0.8369E	01-0.1145E-01	0.1388E	00	0.9621E	03	0.3224E	03	
58	0.4603E	00	0.1251E	00	0.4785E	00	0.1388E	00	0.7163E-01	0.1255E	10	0.8356E	01-0.1149E-01	0.1439E	00	0.9619E	03	0.3183E	03	
59	0.4442E	00	0.1151E	00	0.4768E	00	0.1360E	00	0.6813E-01	0.1137E	10	0.8342E	01-0.1151E-01	0.1492E	00	0.9620E	03	0.3142E	03	
60	0.4274E	00	0.1163E	00	0.4755E	00	0.1351E	00	0.6467E-01	0.1035E	10	0.8327E	01-0.1157E-01	0.1547E	00	0.9614E	03	0.3101E	03	
61	0.4133E	00	0.1064E	00	0.4735E	00	0.1352E	00	0.6138E-01	0.9309E	09	0.8313E	01-0.1161E-01	0.1605E	00	0.9611E	03	0.3061E	03	
62	0.3981E	00	0.1070E	00	0.4710E	00	0.1337E	00	0.5814E-01	0.8278E	09	0.8298E	01-0.1169E-01	0.1666E	00	0.9603E	03	0.3021E	03	
63	0.3857E	00	0.9819E-01	0.4686E	00	0.1343E	00	0.5499E-01	0.7283E	09	0.8283E	01-0.1176E-01	0.1730E	00	0.9598E	03	0.2981E	03		
64	0.3727E	00	0.9860E-01	0.4662E	00	0.1331E	00	0.5189E-01	0.6368E	09	0.8267E	01-0.1187E-01	0.1798E	00	0.9590E	03	0.2943E	03		
65	0.3618E	00	0.9017E-01	0.4633E	00	0.1330E	00	0.4893E-01	0.5534E	09	0.8252E	01-0.1197E-01	0.1870E	00	0.9586E	03	0.2906E	03		
66	0.3496E	00	0.9072E-01	0.4603E	00	0.1317E	00	0.4605E-01	0.4786E	09	0.8236E	01-0.1211E-01	0.1946E	00	0.9579E	03	0.2869E	03		
67	0.3392E	00	0.8383E-01	0.4571E	00	0.1320E	00	0.4332E-01	0.4112E	09	0.8220E	01-0.1225E-01	0.2027E	00	0.9577E	03	0.2834E	03		
68	0.3279E	00	0.8493E-01	0.4541E	00	0.1302E	00	0.4068E-01	0.3511E	09	0.8203E	01-0.1244E-01	0.2113E	00	0.9573E	03	0.2801E	03		
69	0.3186E	00	0.7909E-01	0.4506E	00	0.1291E	00	0.3807E-01	0.2967E	09	0.8186E	01-0.1262E-01	0.2205E	00	0.9572E	03	0.2769E	03		
70	0.3082E	00	0.8038E-01	0.4471E	00	0.1261E	00	0.3551E-01	0.2486E	09	0.8169E	01-0.1285E-01	0.2304E	00	0.9569E	03	0.2740E	03		
71	0.2992E	00	0.7526E-01	0.4434E	00	0.1246E	00	0.3311E-01	0.2060E	09	0.8151E	01-0.1309E-01	0.2409E	00	0.9568E	03	0.2713E	03		
72	0.2891E	00	0.7632E-01	0.4396E	00	0.1216E	00	0.3082E-01	0.1686E	09	0.8133E	01-0.1338E-01	0.2522E	00	0.9565E	03	0.2689E	03		
73	0.2805E	00	0.7194E-01	0.4360E	00	0.1201E	00	0.2858E-01	0.1360E	09	0.8114E	01-0.1367E-01	0.2644E	00	0.9565E	03	0.2669E	03		
74	0.2709E	00	0.7291E-01	0.4321E	00	0.1170E	00	0.2646E-01	0.1070E	09	0.8095E	01-0.1401E-01	0.2775E	00	0.9562E	03	0.2651E	03		
75	0.2627E	00	0.6898E-01	0.4283E	00	0.1145E	00	0.2447E-01	0.8290E	08	0.8075E	01-0.1436E-01	0.2915E	00	0.9562E	03	0.2638E	03		
76	0.2539E	00	0.6964E-01	0.4245E	00	0.1109E	00	0.2255E-01	0.7230E	08	0.8054E	01-0.1477E-01	0.3067E	00	0.9559E	03	0.2628E	03		
77	0.2463E	00	0.6610E-01	0.4209E	00	0.1083E	00	0.2079E-01	0.7008E	08	0.8033E	01-0.1518E-01	0.3231E	00	0.9559E	03	0.2623E	03		
78	0.2382E	00	0.6684E-01	0.4172E	00	0.1054E	00	0.1921E-01	0.6881E	08	0.8010E	01-0.1565E-01	0.3407E	00	0.9557E	03	0.2623E	03		
79	0.2312E	00	0.6375E-01	0.4135E	00	0.1032E	00	0.1787E-01	0.6749E	08	0.7987E	01-0.1612E-01	0.3598E	00	0.9557E	03	0.2628E	03		
80	0.2235E	00	0.6411E-01	0.4097E	00	0.1006E	00	0.1665E-01	0.6591E	08	0.7964E	01-0.1663E-01	0.3803E	00	0.9556E	03	0.2637E	03		
81	0.2168E	00	0.6081E-01	0.4060E	00	0.9883E-01	0.1570E-01	0.6473E	08	0.7939E	01-0.1716E-01	0.4025E	00	0.9556E	03	0.2653E	03			
82	0.2094E	00	0.6053E-01	0.4022E	00	0.9675E-01	0.1494E-01	0.6364E	08	0.7913E	01-0.1772E-01	0.4264E	00	0.9554E	03	0.2673E	03			
83	0.2031E	00	0.5729E-01	0.3983E	00	0.9526E-01	0.1425E-01	0.6241E	08	0.7886E	01-0.1829E-01	0.4522E	00	0.9553E	03	0.2699E	03			
84	0.1962E	00	0.5680E-01	0.3943E	00	0.9357E-01	0.1363E-01	0.6065E	08	0.7858E	01-0.1889E-01	0.4799E	00	0.9550E	03	0.2730E	03			
85	0.1902E	00	0.5406E-01	0.3901E	00	0.9250E-01	0.1306E-01	0.5883E	08	0.7829E	01-0.1948E-01	0.5098E	00	0.9549E	03	0.2766E	03			
86	0.1836E	00	0.5350E-01	0.3858E	00	0.9121E-01	0.1257E-01	0.5743E	08	0.7798E	01-0.2010E-01	0.5420E	00	0.9546E	03	0.2808E	03			
87	0.1777E	00	0.5119E-01	0.3815E	00	0.9057E-01	0.1208E-01	0.5651E	08	0.7766E	01-0.2070E-01	0.5766E	00	0.9544E	03	0.2854E	03			
88	0.1713E	00	0.5078E-01	0.3769E	00	0.8957E-01	0.1163E-01	0.5588E	08	0.7733E	01-0.2132E-01	0.6136E	00	0.9542E	03	0.2905E	03			
89	0.1655E	00	0.4915E-01	0.3723E	00	0.8896E-01	0.1118E-01	0.5530E	08	0.7699E	01-0.2192E-01	0.6534E	00	0.9540E	03	0.2960E	03			
90	0.1593E	00	0.4868E-01	0.3677E	00	0.8846E-01	0.1076E-01	0.5378E	08	0.7663E	01-0.2251E-01	0.6959E	00	0.9537E	03	0.3018E	03			
91	0.1540E	00	0.4759E-01	0.3628E	00	0.8840E-01	0.1037E-01	0.5223E	08	0.7626E	01-0.2307E-01	0.7412E	00	0.9535E	03	0.3080E	03			
92	0.1485E	00	0.4704E-01	0.3577E	00	0.8826E-01	0.1000E-01	0.4987E	08	0.7588E	01-0.2362E-01	0.7895E	00	0.9532E	03	0.3145E	03			
93	0.1436E	00	0.4622E-01	0.3523E	00	0.8788E-01	0.9639E-02	0.4733E	08	0.7548E	01-0.2412E-01	0.8409E	00	0.9531E	03	0.3213E	03			
94	0.1387E	00	0.4556E-01	0.3468E	00	0.8746E-01	0.9313E-02	0.4433E	08	0.7507E	01-0.2459E-01	0.8954E	00	0.9528E	03	0.3282E	03			
95	0.1342E	00	0.4501E-01	0.3410E	00	0.8685E-01	0.8998E-02	0.4139E	08	0.7465E	01-0.2500E-01	0.9530E	00	0.9527E	03	0.3353E	03			
96	0.1292E	00	0.4435E-01	0.3351E	00	0.8600E-01	0.8685E-02	0.3818E	08	0.7422E	01-0.2538E-01	0.1014E	01	0.9525E	03	0.3425E	03			
97	0.1246E	00	0.4417E-01	0.3290E	00	0.8507E-01	0.8390E-02	0.3529E	08	0.7378E	01-0.2569E-01	0.1078E	01	0.9523E	03	0.3498E	03			
98	0.1199E	00	0.4344E-01	0.3228E	00	0.8385E-01	0.8128E-02	0.3222E	08	0.7332E	01-0.2595E-01	0.1145E	01	0.9522E	03	0.3571E	03			
99	0.1156E	00	0.4337E-01	0.3164E	00	0.8253E-01	0.7889E-02	0.2916E	08	0.7287E	01-0.2613E-01	0.1216E	01	0.9521E	03	0.3643E	03			

17	0.05344	0.00	0.00	0.00	-2.67E-02	-1.09E-02	-1.48E-02	4.33E-03	1.44E-02	1.60E-02	1.46E-02	1.41E-02	1.67E-02
16	0.05078	0.00	0.00	0.00	-1.96E-02	-1.59E-02	-1.18E-02	5.10E-03	1.36E-02	1.42E-02	1.25E-02	1.25E-02	1.55E-02
15	0.04812	0.00	0.00	0.00	-1.03E-02	-1.70E-02	-9.62E-03	5.71E-03	1.24E-02	1.21E-02	1.03E-02	1.10E-02	1.42E-02
14	0.04562	0.00	0.00	-2.75E-02	-1.23E-02	-1.57E-02	-7.81E-03	5.81E-03	1.06E-02	9.52E-03	8.36E-03	9.82E-03	1.24E-02
13	0.04328	0.00	0.00	-2.31E-02	-1.94E-02	-1.61E-02	-6.89E-03	5.05E-03	8.37E-03	6.71E-03	6.78E-03	8.34E-03	9.95E-03
12	0.04094	0.00	0.00	-1.08E-02	-2.06E-02	-1.69E-02	-6.84E-03	3.53E-03	5.35E-03	4.41E-03	5.28E-03	5.93E-03	6.12E-03
11	0.03719	0.00	-5.70E-03	-1.12E-02	-2.21E-02	-2.02E-02	-9.04E-03	-1.19E-03	-1.27E-04	6.95E-04	1.45E-03	-4.84E-04	-2.26E-03
10	0.03437	0.00	-2.45E-03	-1.86E-02	-2.82E-02	-2.49E-02	-1.25E-02	-5.39E-03	-5.07E-03	-2.48E-03	-3.50E-03	-7.42E-03	-1.06E-02
9	0.03219	0.00	6.50E-03	-2.31E-02	-3.54E-02	-3.01E-02	-1.71E-02	-1.12E-02	-8.84E-03	-6.55E-03	-8.95E-03	-1.40E-02	-1.83E-02
8	0.03031	0.00	3.06E-03	-3.01E-02	-4.29E-02	-3.64E-02	-2.31E-02	-1.56E-02	-1.28E-02	-1.09E-02	-1.44E-02	-2.03E-02	-2.57E-02
7	0.02687	0.00	-2.45E-02	-4.78E-02	-6.00E-02	-4.87E-02	-3.01E-02	-2.76E-02	-2.23E-02	-2.16E-02	-2.69E-02	-3.42E-02	-4.06E-02
6	0.02187	0.00	-5.91E-02	-7.73E-02	-8.72E-02	-7.00E-02	-5.89E-02	-4.79E-02	-4.15E-02	-4.34E-02	-5.00E-02	-5.71E-02	-6.47E-02
5	0.01625	0.00	-9.58E-02	-1.13E-01	-1.20E-01	-1.11E-01	-6.13E-02	-7.17E-02	-7.07E-02	-7.34E-02	-7.87E-02	-8.44E-02	-9.18E-02
4	0.01062	0.00	-1.32E-01	-1.48E-01	-1.63E-01	-1.27E-01	-1.03E-01	-9.93E-02	-1.01E-01	-1.03E-01	-1.05E-01	-1.09E-01	-1.15E-01
3	0.00562	0.00	-1.74E-01	-1.75E-01	-1.77E-01	-1.50E-01	-1.30E-01	-1.21E-01	-1.21E-01	-1.22E-01	-1.21E-01	-1.24E-01	-1.29E-01
2	0.00156	0.00	-2.11E-01	-1.87E-01	-1.90E-01	-1.60E-01	-1.41E-01	-1.30E-01	-1.29E-01	-1.29E-01	-1.28E-01	-1.30E-01	-1.35E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y	21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.54E-02	3.49E-02	4.88E-02	6.91E-02	9.60E-02	1.30E-01	1.69E-01	2.09E-01	2.49E-01	2.89E-01	0.00	0.00
19	0.05937	2.45E-02	3.38E-02	4.70E-02	6.65E-02	9.17E-02	1.24E-01	1.60E-01	1.97E-01	2.34E-01	2.69E-01	0.00	0.00
18	0.05594	2.32E-02	3.20E-02	4.39E-02	6.12E-02	8.29E-02	1.10E-01	1.41E-01	1.72E-01	2.01E-01	2.29E-01	0.00	0.00
17	0.05344	2.19E-02	3.01E-02	4.08E-02	5.61E-02	7.46E-02	9.79E-02	1.24E-01	1.49E-01	1.73E-01	1.95E-01	0.00	0.00
16	0.05078	2.04E-02	2.72E-02	3.64E-02	4.90E-02	6.39E-02	8.28E-02	1.03E-01	1.22E-01	1.40E-01	1.55E-01	0.00	0.00
15	0.04812	1.82E-02	2.35E-02	3.07E-02	4.05E-02	5.15E-02	6.55E-02	7.95E-02	9.28E-02	1.04E-01	1.13E-01	0.00	0.00
14	0.04562	1.51E-02	1.89E-02	2.41E-02	3.10E-02	3.83E-02	4.74E-02	5.58E-02	6.36E-02	6.93E-02	7.33E-02	0.00	0.00
13	0.04328	1.12E-02	1.36E-02	1.68E-02	2.07E-02	2.46E-02	2.90E-02	3.23E-02	3.51E-02	3.59E-02	3.52E-02	0.00	0.00
12	0.04094	6.06E-03	7.08E-03	8.37E-03	9.23E-03	9.79E-03	9.76E-03	7.98E-03	5.97E-03	2.13E-03	-2.65E-03	0.00	0.00
11	0.03719	-4.71E-03	-6.00E-03	-7.84E-03	-1.13E-02	-1.63E-02	-2.33E-02	-3.26E-02	-4.16E-02	-5.20E-02	-6.24E-02	0.00	0.00
10	0.03437	-1.47E-02	-1.77E-02	-2.19E-02	-2.85E-02	-3.76E-02	-4.92E-02	-6.35E-02	-7.71E-02	-9.18E-02	-1.06E-01	0.00	0.00
9	0.03219	-2.33E-02	-2.79E-02	-3.38E-02	-4.27E-02	-5.48E-02	-6.98E-02	-8.76E-02	-1.04E-01	-1.22E-01	-1.38E-01	0.00	0.00
8	0.03031	-3.16E-02	-3.72E-02	-4.45E-02	-5.53E-02	-6.95E-02	-8.73E-02	-1.08E-01	-1.27E-01	-1.47E-01	-1.65E-01	0.00	0.00
7	0.02687	-4.78E-02	-5.52E-02	-6.47E-02	-7.88E-02	-9.66E-02	-1.19E-01	-1.43E-01	-1.67E-01	-1.90E-01	-2.11E-01	0.00	0.00
6	0.02187	-7.31E-02	-8.20E-02	-9.41E-02	-1.12E-01	-1.34E-01	-1.61E-01	-1.90E-01	-2.19E-01	-2.46E-01	-2.69E-01	0.00	0.00
5	0.01625	-1.01E-01	-1.11E-01	-1.25E-01	-1.45E-01	-1.70E-01	-2.01E-01	-2.34E-01	-2.66E-01	-2.97E-01	-3.22E-01	0.00	0.00
4	0.01062	-1.24E-01	-1.34E-01	-1.49E-01	-1.72E-01	-1.98E-01	-2.31E-01	-2.66E-01	-3.01E-01	-3.33E-01	-3.59E-01	0.00	0.00
3	0.00562	-1.37E-01	-1.49E-01	-1.64E-01	-1.87E-01	-2.15E-01	-2.48E-01	-2.85E-01	-3.20E-01	-3.54E-01	-3.80E-01	0.00	0.00
2	0.00156	-1.43E-01	-1.54E-01	-1.70E-01	-1.93E-01	-2.21E-01	-2.54E-01	-2.91E-01	-3.27E-01	-3.61E-01	-3.88E-01	0.00	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*	***	***	***	***	***	***	***	***	***	***	***	***	***
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y	21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.13E 00	9.62E-01	8.85E-01	8.22E-01	7.71E-01	7.30E-01	7.04E-01	7.16E-01
19	0.05937	0.00	0.00	0.00	0.00	3.50E 00	4.61E 00	3.94E 00	3.22E 00	2.66E 00	2.25E 00	2.01E 00	2.16E 00
18	0.05594	0.00	0.00	0.00	0.00	5.19E 00	4.90E 00	4.23E 00	3.57E 00	3.03E 00	2.61E 00	2.36E 00	2.96E 00
17	0.05344	0.00	0.00	0.00	1.67E 00	4.77E 00	4.60E 00	3.95E 00	3.40E 00	2.95E 00	2.59E 00	2.50E 00	3.83E 00
16	0.05078	0.00	0.00	0.00	5.89E 00	5.70E 00	4.76E 00	3.85E 00	3.20E 00	2.74E 00	2.42E 00	2.76E 00	5.20E 00
15	0.04812	0.00	0.00	0.00	7.47E 00	5.99E 00	4.66E 00	3.63E 00	2.93E 00	2.46E 00	2.22E 00	3.66E 00	7.16E 00
14	0.04562	0.00	0.00	2.16E 00	7.72E 00	5.99E 00	4.53E 00	3.46E 00	2.72E 00	2.23E 00	2.42E 00	5.58E 00	9.49E 00
13	0.04328	0.00	0.00	8.47E 00	8.62E 00	6.03E 00	4.46E 00	3.41E 00	2.64E 00	2.22E 00	3.88E 00	8.28E 00	1.19E 01

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	0.00000	0.00	0.00	0.00	6.78E-02	1.43E-01	2.07E-01	2.49E-01	2.60E-01	2.44E-01	2.12E-01	1.79E-01	1.38E-01
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299	
0	J	Y											
11	1.00000	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	4.75E-01	4.76E-01	4.77E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01
9	0.80000	4.52E-01	4.54E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01
8	0.70000	4.30E-01	4.32E-01	4.32E-01	4.32E-01	4.32E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01
7	0.60000	4.07E-01	4.08E-01	4.09E-01	4.08E-01	4.07E-01	4.06E-01	4.05E-01	4.04E-01	4.04E-01	4.05E-01	4.05E-01	4.05E-01
6	0.50000	3.83E-01	3.84E-01	3.83E-01	3.81E-01	3.79E-01	3.77E-01	3.76E-01	3.75E-01	3.75E-01	3.75E-01	3.75E-01	3.75E-01
5	0.40000	3.58E-01	3.57E-01	3.55E-01	3.52E-01	3.48E-01	3.46E-01	3.43E-01	3.42E-01	3.42E-01	3.42E-01	3.42E-01	3.42E-01
4	0.30000	3.29E-01	3.26E-01	3.22E-01	3.17E-01	3.12E-01	3.08E-01	3.05E-01	3.03E-01	3.03E-01	3.03E-01	3.03E-01	3.03E-01
3	0.20000	2.94E-01	2.88E-01	2.81E-01	2.74E-01	2.67E-01	2.61E-01	2.58E-01	2.55E-01	2.54E-01	2.54E-01	2.54E-01	2.54E-01
2	0.10000	2.45E-01	2.34E-01	2.22E-01	2.11E-01	2.01E-01	1.94E-01	1.89E-01	1.86E-01	1.85E-01	1.85E-01	1.85E-01	1.85E-01
1	0.00000	7.29E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	DIMENSIONLESS PRESSURE												
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0	J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	3.90E 05	3.93E 05	3.89E 05	3.84E 05	3.83E 05	3.83E 05	3.84E 05	3.84E 05
19	0.47500	0.00	0.00	0.00	0.00	3.87E 05	3.90E 05	3.86E 05	3.82E 05	3.80E 05	3.81E 05	3.81E 05	3.82E 05
18	0.44750	0.00	0.00	0.00	0.00	3.81E 05	3.85E 05	3.81E 05	3.77E 05	3.76E 05	3.77E 05	3.78E 05	3.78E 05
17	0.42750	0.00	0.00	0.00	3.72E 05	3.77E 05	3.81E 05	3.77E 05	3.74E 05	3.73E 05	3.74E 05	3.75E 05	3.75E 05
16	0.40625	0.00	0.00	0.00	3.66E 05	3.73E 05	3.75E 05	3.72E 05	3.70E 05	3.70E 05	3.71E 05	3.71E 05	3.71E 05
15	0.38500	0.00	0.00	0.00	3.56E 05	3.67E 05	3.69E 05	3.66E 05	3.65E 05	3.65E 05	3.67E 05	3.68E 05	3.67E 05
14	0.36500	0.00	0.00	3.31E 05	3.47E 05	3.60E 05	3.62E 05	3.60E 05	3.60E 05	3.61E 05	3.63E 05	3.64E 05	3.63E 05
13	0.34625	0.00	0.00	3.21E 05	3.39E 05	3.52E 05	3.55E 05	3.54E 05	3.55E 05	3.57E 05	3.59E 05	3.59E 05	3.58E 05
12	0.32750	0.00	0.00	3.05E 05	3.30E 05	3.43E 05	3.47E 05	3.47E 05	3.49E 05	3.53E 05	3.55E 05	3.55E 05	3.54E 05
11	0.29750	0.00	2.20E 05	2.75E 05	3.13E 05	3.29E 05	3.32E 05	3.34E 05	3.40E 05	3.45E 05	3.46E 05	3.46E 05	3.45E 05
10	0.27500	0.00	1.89E 05	2.60E 05	3.00E 05	3.16E 05	3.20E 05	3.24E 05	3.32E 05	3.37E 05	3.39E 05	3.39E 05	3.38E 05
9	0.25750	0.00	1.50E 05	2.51E 05	2.89E 05	3.06E 05	3.11E 05	3.17E 05	3.25E 05	3.31E 05	3.33E 05	3.33E 05	3.33E 05
8	0.24250	0.00	1.42E 05	2.40E 05	2.80E 05	2.97E 05	3.03E 05	3.10E 05	3.20E 05	3.25E 05	3.27E 05	3.27E 05	3.28E 05
7	0.21500	0.00	1.63E 05	2.26E 05	2.65E 05	2.82E 05	2.89E 05	2.99E 05	3.08E 05	3.13E 05	3.15E 05	3.17E 05	3.19E 05
6	0.17500	0.00	1.71E 05	2.13E 05	2.46E 05	2.60E 05	2.68E 05	2.80E 05	2.88E 05	2.94E 05	2.98E 05	3.03E 05	3.07E 05
5	0.13000	0.00	1.60E 05	1.97E 05	2.26E 05	2.38E 05	2.47E 05	2.58E 05	2.66E 05	2.73E 05	2.80E 05	2.88E 05	2.95E 05
4	0.08500	0.00	1.24E 05	1.78E 05	2.06E 05	2.20E 05	2.27E 05	2.37E 05	2.46E 05	2.56E 05	2.66E 05	2.76E 05	2.85E 05
3	0.04500	0.00	5.27E 04	1.64E 05	1.93E 05	2.05E 05	2.14E 05	2.24E 05	2.34E 05	2.45E 05	2.57E 05	2.69E 05	2.79E 05
2	0.01250	0.00	0.00	1.55E 05	1.81E 05	1.99E 05	2.09E 05	2.19E 05	2.30E 05	2.41E 05	2.54E 05	2.66E 05	2.77E 05
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015	
0	J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	3.84E 05	3.84E 05	3.84E 05	3.83E 05	3.83E 05	3.81E 05	3.80E 05	3.78E 05	3.76E 05	3.74E 05	0.00	0.00
19	0.47500	3.82E 05	3.81E 05	3.81E 05	3.80E 05	3.79E 05	3.78E 05	3.76E 05	3.75E 05	3.73E 05	3.71E 05	0.00	0.00
18	0.44750	3.77E 05	3.77E 05	3.76E 05	3.75E 05	3.74E 05	3.72E 05	3.71E 05	3.70E 05	3.68E 05	3.66E 05	0.00	0.00
17	0.42750	3.74E 05	3.73E 05	3.72E 05	3.71E 05	3.70E 05	3.68E 05	3.67E 05	3.66E 05	3.65E 05	3.63E 05	0.00	0.00
16	0.40625	3.70E 05	3.69E 05	3.68E 05	3.67E 05	3.65E 05	3.64E 05	3.63E 05	3.62E 05	3.61E 05	3.60E 05	0.00	0.00
15	0.38500	3.66E 05	3.65E 05	3.63E 05	3.62E 05	3.61E 05	3.60E 05	3.59E 05	3.58E 05	3.57E 05	3.56E 05	0.00	0.00
14	0.36500	3.62E 05	3.60E 05	3.59E 05	3.58E 05	3.57E 05	3.56E 05	3.56E 05	3.55E 05	3.54E 05	3.53E 05	0.00	0.00
13	0.34625	3.57E 05	3.56E 05	3.55E 05	3.54E 05	3.54E 05	3.53E 05	3.52E 05	3.52E 05	3.51E 05	3.51E 05	0.00	0.00
12	0.32750	3.53E 05	3.52E 05	3.51E 05	3.51E 05	3.50E 05	3.50E 05	3.49E 05	3.49E 05	3.49E 05	3.48E 05	0.00	0.00
11	0.29750	3.45E 05	3.45E 05	3.45E 05	3.45E 05	3.44E 05	3.44E 05	3.44E 05	3.44E 05	3.44E 05	3.45E 05	3.45E 05	0.00

[illegible]

1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	W VELOCITY												0.00			
0	I =	1	2	3	4	5	6	7	8	9	10	11	12			
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552			
0	J	Y														
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	0.00	0.00	0.00	0.00	0.00	1.45E 01	1.45E 01	1.45E 01	1.44E 01	1.44E 01	1.44E 01	1.46E 01	1.56E 01	0.00	
19	0.05937	0.00	0.00	0.00	0.00	0.00	1.50E 01	1.49E 01	1.49E 01	1.50E 01	1.50E 01	1.52E 01	1.57E 01	1.67E 01	0.00	
18	0.05594	0.00	0.00	0.00	0.00	0.00	1.55E 01	1.51E 01	1.50E 01	1.51E 01	1.52E 01	1.56E 01	1.64E 01	1.73E 01	0.00	
17	0.05344	0.00	0.00	0.00	0.00	1.75E 01	1.63E 01	1.55E 01	1.53E 01	1.53E 01	1.55E 01	1.61E 01	1.69E 01	1.77E 01	0.00	
16	0.05078	0.00	0.00	0.00	0.00	1.82E 01	1.65E 01	1.56E 01	1.54E 01	1.55E 01	1.59E 01	1.67E 01	1.75E 01	1.80E 01	0.00	
15	0.04812	0.00	0.00	0.00	0.00	1.89E 01	1.67E 01	1.56E 01	1.54E 01	1.57E 01	1.65E 01	1.74E 01	1.80E 01	1.82E 01	0.00	
14	0.04562	0.00	0.00	2.27E 01	1.99E 01	1.69E 01	1.55E 01	1.54E 01	1.61E 01	1.72E 01	1.80E 01	1.83E 01	1.83E 01	1.83E 01	0.00	
13	0.04328	0.00	0.00	2.36E 01	2.00E 01	1.67E 01	1.53E 01	1.56E 01	1.67E 01	1.79E 01	1.84E 01	1.85E 01	1.83E 01	1.83E 01	0.00	
12	0.04094	0.00	0.00	2.46E 01	2.02E 01	1.65E 01	1.52E 01	1.59E 01	1.74E 01	1.84E 01	1.87E 01	1.86E 01	1.82E 01	1.82E 01	0.00	
11	0.03719	0.00	3.12E 01	2.63E 01	2.04E 01	1.63E 01	1.53E 01	1.68E 01	1.83E 01	1.89E 01	1.88E 01	1.84E 01	1.77E 01	1.77E 01	0.00	
10	0.03437	0.00	3.28E 01	2.71E 01	2.03E 01	1.59E 01	1.55E 01	1.75E 01	1.87E 01	1.90E 01	1.86E 01	1.80E 01	1.72E 01	1.72E 01	0.00	
9	0.03219	0.00	3.47E 01	2.76E 01	1.99E 01	1.55E 01	1.58E 01	1.79E 01	1.88E 01	1.88E 01	1.83E 01	1.75E 01	1.67E 01	1.67E 01	0.00	
8	0.03031	4.28E 01	3.68E 01	2.77E 01	1.93E 01	1.52E 01	1.61E 01	1.80E 01	1.86E 01	1.84E 01	1.78E 01	1.70E 01	1.62E 01	1.62E 01	0.00	
7	0.02687	4.28E 01	3.65E 01	2.67E 01	1.83E 01	1.49E 01	1.65E 01	1.78E 01	1.79E 01	1.75E 01	1.68E 01	1.59E 01	1.50E 01	1.50E 01	0.00	
6	0.02187	4.28E 01	3.53E 01	2.45E 01	1.65E 01	1.46E 01	1.59E 01	1.61E 01	1.59E 01	1.54E 01	1.46E 01	1.38E 01	1.29E 01	1.29E 01	0.00	
5	0.01625	4.28E 01	3.31E 01	2.10E 01	1.41E 01	1.32E 01	1.32E 01	1.30E 01	1.26E 01	1.21E 01	1.15E 01	1.08E 01	1.01E 01	1.01E 01	0.00	
4	0.01062	4.28E 01	2.97E 01	1.60E 01	8.75E 00	9.82E 00	9.29E 00	8.96E 00	8.64E 00	8.27E 00	7.83E 00	7.35E 00	6.86E 00	6.86E 00	0.00	
3	0.00562	4.28E 01	2.41E 01	8.10E 00	5.58E 00	5.58E 00	5.14E 00	4.90E 00	4.71E 00	4.51E 00	4.27E 00	4.00E 00	3.73E 00	3.73E 00	0.00	

[illegible]

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 0.000

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 0.000

COMPUTED INLET SWIRL NUMBER = 0.0000

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

```
0*- - - - - U VELOCITY - - - - -
0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = 0.00000 0.00000 0.00787 0.01617 0.02539 0.03561 0.04697 0.05957 0.07356 0.08909 0.10632 0.12545
0 J Y
21 0.06312 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06187 0.00 0.00 0.00 0.00 0.00 0.00-2.13E 00-3.42E 00-4.17E 00-4.66E 00-4.95E 00-5.00E 00-4.75E 00
19 0.05937 0.00 0.00 0.00 0.00 0.00 0.00-2.14E 00-3.20E 00-3.85E 00-4.26E 00-4.47E 00-4.45E 00-4.14E 00
18 0.05594 0.00 0.00 0.00 0.00 0.00 0.00-2.06E 00-2.78E 00-3.26E 00-3.55E 00-3.65E 00-3.54E 00-3.17E 00
17 0.05344 0.00 0.00 0.00 0.00 0.00-2.28E 00-1.97E 00-2.39E 00-2.71E 00-2.87E 00-2.87E 00-2.69E 00-2.27E 00
16 0.05078 0.00 0.00 0.00 0.00 0.00-2.07E 00-1.74E 00-1.87E 00-1.97E 00-1.96E 00-1.83E 00-1.55E 00-1.08E 00
15 0.04812 0.00 0.00 0.00 0.00-1.91E 00-1.39E 00-1.19E 00-1.03E 00-8.15E-01-5.36E-01-1.55E-01 3.59E-01
14 0.04562 0.00 0.00 0.00-2.64E 00-1.82E 00-9.16E-01-3.24E-01 1.25E-01 5.41E-01 9.63E-01 1.43E 00 1.97E 00
13 0.04328 0.00 0.00 0.00-2.51E 00-1.60E 00-1.67E-01 8.07E-01 1.52E 00 2.12E 00 2.66E 00 3.19E 00 3.72E 00
12 0.04094 0.00 0.00 0.00-2.45E 00-9.37E-01 1.15E 00 2.41E 00 3.33E 00 4.06E 00 4.68E 00 5.24E 00 5.71E 00
11 0.03719 0.00 0.00-4.99E 00-2.39E-01 2.69E 00 4.74E 00 6.20E 00 7.29E 00 8.10E 00 8.72E 00 9.20E 00 9.47E 00
10 0.03437 0.00 0.00 1.89E 00 5.74E 00 7.91E 00 9.53E 00 1.08E 01 1.16E 01 1.22E 01 1.26E 01 1.28E 01 1.28E 01
9 0.03219 0.00 0.00 1.09E 01 1.29E 01 1.41E 01 1.51E 01 1.57E 01 1.60E 01 1.62E 01 1.62E 01 1.61E 01 1.56E 01
8 0.03031 0.00 3.00E 01 2.73E 01 2.53E 01 2.37E 01 2.22E 01 2.11E 01 2.03E 01 1.99E 01 1.96E 01 1.91E 01 1.82E 01
7 0.02687 0.00 3.00E 01 2.98E 01 2.97E 01 2.95E 01 2.93E 01 2.90E 01 2.84E 01 2.74E 01 2.61E 01 2.45E 01 2.28E 01
6 0.02187 0.00 3.00E 01 2.99E 01 2.98E 01 2.97E 01 2.97E 01 2.97E 01 2.96E 01 2.94E 01 2.91E 01 2.83E 01 2.71E 01
5 0.01625 0.00 3.00E 01 2.99E 01 2.98E 01 2.98E 01 2.97E 01 2.97E 01 2.96E 01 2.95E 01 2.93E 01 2.89E 01 2.83E 01
4 0.01062 0.00 3.00E 01 2.99E 01 2.99E 01 2.98E 01 2.98E 01 2.97E 01 2.97E 01 2.95E 01 2.93E 01 2.89E 01 2.84E 01
3 0.00562 0.00 3.00E 01 3.00E 01 2.99E 01 2.98E 01 2.98E 01 2.97E 01 2.97E 01 2.95E 01 2.93E 01 2.89E 01 2.84E 01
2 0.00156 0.00 3.00E 01 3.00E 01 2.99E 01 2.98E 01 2.98E 01 2.97E 01 2.97E 01 2.95E 01 2.93E 01 2.89E 01 2.84E 01
1-0.00156 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 0.14669 0.17026 0.19643 0.22547 0.25771 0.29349 0.33321 0.37500 0.41679 0.45858 0.50037
0 J Y
21 0.06312 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06187 -4.13E 00-3.16E 00-1.94E 00-5.76E-01 8.54E-01 2.12E 00 3.28E 00 4.21E 00 4.92E 00 5.40E 00 5.40E 00
19 0.05937 -3.49E 00-2.51E 00-1.29E 00 4.47E-02 1.39E 00 2.62E 00 3.73E 00 4.63E 00 5.31E 00 5.77E 00 5.77E 00
18 0.05594 -2.49E 00-1.53E 00-3.80E-01 8.49E-01 2.07E 00 3.20E 00 4.22E 00 5.04E 00 5.66E 00 6.07E 00 6.07E 00
17 0.05344 -1.59E 00-6.68E-01 3.98E-01 1.52E 00 2.62E 00 3.66E 00 4.59E 00 5.34E 00 5.90E 00 6.27E 00 6.27E 00
16 0.05078 -4.10E-01 4.31E-01 1.38E 00 2.36E 00 3.31E 00 4.21E 00 5.03E 00 5.69E 00 6.18E 00 6.50E 00 6.50E 00
15 0.04812 9.98E-01 1.73E 00 2.52E 00 3.32E 00 4.09E 00 4.84E 00 5.53E 00 6.07E 00 6.48E 00 6.74E 00 6.74E 00
14 0.04562 2.55E 00 3.15E 00 3.75E 00 4.35E 00 4.93E 00 5.51E 00 6.04E 00 6.47E 00 6.79E 00 6.99E 00 6.99E 00
13 0.04328 4.21E 00 4.64E 00 5.04E 00 5.43E 00 5.80E 00 6.19E 00 6.57E 00 6.87E 00 7.09E 00 7.23E 00 7.23E 00
12 0.04094 6.07E 00 6.31E 00 6.47E 00 6.61E 00 6.75E 00 6.94E 00 7.13E 00 7.30E 00 7.41E 00 7.48E 00 7.48E 00
11 0.03719 9.50E 00 9.32E 00 9.02E 00 8.70E 00 8.43E 00 8.24E 00 8.12E 00 8.04E 00 7.96E 00 7.91E 00 7.91E 00
10 0.03437 1.24E 01 1.18E 01 1.11E 01 1.04E 01 9.79E 00 9.31E 00 8.92E 00 8.62E 00 8.40E 00 8.24E 00 8.24E 00
9 0.03219 1.49E 01 1.39E 01 1.28E 01 1.18E 01 1.09E 01 1.02E 01 9.57E 00 9.10E 00 8.74E 00 8.50E 00 8.50E 00
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3	0.00562	0.00	3.24E-02	3.24E-02	3.23E-02	3.22E-02	3.22E-02	3.21E-02	3.20E-02	3.19E-02	3.16E-02	3.13E-02	3.07E-02
2	0.00156	0.00	2.50E-03	2.50E-03	2.49E-03	2.49E-03	2.48E-03	2.48E-03	2.47E-03	2.46E-03	2.44E-03	2.41E-03	2.37E-03
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037	
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.01E 00	1.00E 00	1.00E 00	9.98E-01	9.95E-01	9.92E-01	9.89E-01	9.87E-01	9.86E-01	9.85E-01	9.85E-01	
19	0.05937	1.05E 00	1.03E 00	1.02E 00	1.00E 00	9.83E-01	9.67E-01	9.53E-01	9.42E-01	9.33E-01	9.27E-01	9.27E-01	
18	0.05594	1.09E 00	1.06E 00	1.03E 00	9.95E-01	9.60E-01	9.28E-01	9.00E-01	8.77E-01	8.59E-01	8.47E-01	8.47E-01	
17	0.05344	1.11E 00	1.07E 00	1.03E 00	9.84E-01	9.38E-01	8.96E-01	8.58E-01	8.28E-01	8.05E-01	7.90E-01	7.90E-01	
16	0.05078	1.12E 00	1.07E 00	1.02E 00	9.66E-01	9.10E-01	8.59E-01	8.13E-01	7.76E-01	7.48E-01	7.29E-01	7.29E-01	
15	0.04812	1.11E 00	1.06E 00	1.00E 00	9.41E-01	8.77E-01	8.18E-01	7.66E-01	7.23E-01	6.91E-01	6.70E-01	6.70E-01	
14	0.04562	1.10E 00	1.04E 00	9.79E-01	9.10E-01	8.41E-01	7.77E-01	7.20E-01	6.73E-01	6.38E-01	6.15E-01	6.15E-01	
13	0.04328	1.08E 00	1.02E 00	9.48E-01	8.75E-01	8.03E-01	7.36E-01	6.75E-01	6.26E-01	5.89E-01	5.65E-01	5.65E-01	
12	0.04094	1.04E 00	9.80E-01	9.10E-01	8.35E-01	7.61E-01	6.91E-01	6.29E-01	5.78E-01	5.40E-01	5.15E-01	5.15E-01	
11	0.03719	9.65E-01	9.03E-01	8.33E-01	7.59E-01	6.85E-01	6.16E-01	5.53E-01	5.02E-01	4.63E-01	4.38E-01	4.38E-01	
10	0.03437	8.90E-01	8.31E-01	7.64E-01	6.93E-01	6.23E-01	5.56E-01	4.94E-01	4.44E-01	4.07E-01	3.83E-01	3.83E-01	
9	0.03219	8.22E-01	7.67E-01	7.04E-01	6.38E-01	5.72E-01	5.07E-01	4.48E-01	4.00E-01	3.64E-01	3.41E-01	3.41E-01	
8	0.03031	7.58E-01	7.08E-01	6.50E-01	5.89E-01	5.26E-01	4.65E-01	4.09E-01	3.63E-01	3.29E-01	3.07E-01	3.07E-01	
7	0.02687	6.31E-01	5.92E-01	5.45E-01	4.94E-01	4.40E-01	3.87E-01	3.38E-01	2.97E-01	2.67E-01	2.47E-01	2.47E-01	
6	0.02187	4.41E-01	4.18E-01	3.88E-01	3.54E-01	3.16E-01	2.77E-01	2.39E-01	2.07E-01	1.84E-01	1.69E-01	1.69E-01	
5	0.01625	2.49E-01	2.39E-01	2.26E-01	2.09E-01	1.87E-01	1.64E-01	1.40E-01	1.20E-01	1.05E-01	9.60E-02	9.60E-02	
4	0.01062	1.07E-01	1.04E-01	9.95E-02	9.31E-02	8.43E-02	7.36E-02	6.26E-02	5.33E-02	4.64E-02	4.20E-02	4.20E-02	
3	0.00562	3.00E-02	2.92E-02	2.82E-02	2.67E-02	2.43E-02	2.12E-02	1.80E-02	1.53E-02	1.32E-02	1.19E-02	1.19E-02	
2	0.00156	2.32E-03	2.26E-03	2.19E-03	2.08E-03	1.90E-03	1.66E-03	1.41E-03	1.19E-0				

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415

0 J	Y	1	2	3	4	5	6	7	8	9	10	11	12
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	4.30E 00	6.76E 00	8.19E 00	9.50E 00	1.08E 01	1.21E 01	1.33E 01
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	7.35E 01	1.85E 02	2.37E 02	2.91E 02	3.48E 02	4.07E 02	4.69E 02
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	8.30E 01	2.81E 02	3.69E 02	4.59E 02	5.55E 02	6.61E 02	7.78E 02
17	0.42750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.20E 01	1.34E 02	3.13E 02	4.08E 02	5.09E 02	6.18E 02	7.41E 02	8.79E 02
16	0.40625	1.00E 00	1.00E 00	1.00E 00	1.00E 00	6.40E 01	1.77E 02	3.26E 02	4.23E 02	5.30E 02	6.49E 02	7.83E 02	9.38E 02
15	0.38500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	6.76E 01	2.03E 02	3.22E 02	4.17E 02	5.29E 02	6.54E 02	7.97E 02	9.64E 02
14	0.36500	1.00E 00	1.00E 00	1.21E 01	9.89E 01	2.16E 02	3.04E 02	3.99E 02	5.14E 02	6.44E 02	7.93E 02	9.67E 02	1.16E 03
13	0.34625	1.00E 00	1.00E 00	6.24E 01	1.46E 02	2.14E 02	2.86E 02	3.81E 02	4.95E 02	6.26E 02	7.77E 02	9.55E 02	1.15E 03
12	0.32750	1.00E 00	1.00E 00	7.70E 01	1.97E 02	2.26E 02	2.90E 02	3.72E 02	4.76E 02	6.01E 02	7.50E 02	9.28E 02	1.13E 03
11	0.29750	1.00E 00	4.54E 01	1.51E 02	2.54E 02	2.84E 02	3.14E 02	3.64E 02	4.41E 02	5.45E 02	6.80E 02	8.53E 02	1.06E 03
10	0.27500	1.00E 00	2.24E 02	3.48E 02	3.29E 02	3.13E 02	3.16E 02	3.46E 02	4.03E 02	4.88E 02	6.09E 02	7.74E 02	9.82E 02
9	0.25750	1.00E 00	5.21E 02	3.66E 02	3.04E 02	2.74E 02	2.75E 02	3.06E 02	3.61E 02	4.35E 02	5.43E 02	7.02E 02	9.09E 02
8	0.24250	1.00E 00	1.25E 01	2.53E 01	5.74E 01	1.16E 02	1.88E 02	2.56E 02	3.14E 02	3.77E 02	4.77E 02	6.34E 02	8.38E 02
7	0.21500	1.00E 00	6.94E 00	5.66E 00	5.31E 00	6.21E 00	1.13E 01	3.14E 01	1.02E 02	2.46E 02	4.17E 02	5.58E 02	7.12E 02
6	0.17500	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.98E 00	4.95E 00	5.00E 00	5.51E 00	1.00E 01	4.53E 01	2.66E 02	5.86E 02
5	0.13000	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.99E 00	4.95E 00	4.98E 00	5.04E 00	5.12E 00	5.21E 00	5.30E 00	5.40E 00
4	0.08500	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.99E 00	4.95E 00	4.98E 00	5.04E 00	5.12E 00	5.21E 00	5.30E 00	5.40E 00
3	0.04500	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.99E 00	4.95E 00	4.98E 00	5.04E 00	5.12E 00	5.21E 00	5.30E 00	5.40E 00
2	0.01250	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.99E 00	4.95E 00	4.98E 00	5.04E 00	5.12E 00	5.21E 00	5.31E 00	5.40E 00
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015

0 J	Y	1	2	3	4	5	6	7	8	9	10	11	12
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.52E 01	1.56E 01	1.55E 01	1.50E 01	1.42E 01	1.33E 01	1.23E 01	1.14E 01	1.06E 01	9.78E 00	1.00E 00	1.00E 00
19	0.47500	5.77E 02	6.06E 02	6.11E 02	5.95E 02	5.63E 02	5.21E 02	4.72E 02	4.24E 02	3.79E 02	3.39E 02	1.00E 00	1.00E 00
18	0.44750	1.01E 03	1.09E 03	1.13E 03	1.13E 03	1.10E 03	1.04E 03	9.57E 02	8.72E 02	7.89E 02	7.12E 02	1.00E 00	1.00E 00
17	0.42750	1.16E 03	1.28E 03	1.35E 03	1.37E 03	1.35E 03	1.29E 03	1.21E 03	1.11E 03	1.01E 03	9.24E 02	1.00E 00	1.00E 00
16	0.40625	1.26E 03	1.40E 03	1.50E 03	1.54E 03	1.54E 03	1.49E 03	1.41E 03	1.31E 03	1.20E 03	1.11E 03	1.00E 00	1.00E 00
15	0.38500	1.32E 03	1.48E 03	1.59E 03	1.66E 03	1.67E 03	1.63E 03	1.55E 03	1.46E 03	1.35E 03	1.25E 03	1.00E 00	1.00E 00
14	0.36500	1.35E 03	1.52E 03	1.65E 03	1.73E 03	1.76E 03	1.73E 03	1.66E 03	1.57E 03	1.46E 03	1.37E 03	1.00E 00	1.00E 00
13	0.34625	1.36E 03	1.54E 03	1.69E 03	1.78E 03	1.82E 03	1.81E 03	1.75E 03	1.65E 03	1.55E 03	1.45E 03	1.00E 00	1.00E 00
12	0.32750	1.34E 03	1.54E 03	1.71E 03	1.82E 03	1.87E 03	1.87E 03	1.81E 03	1.72E 03	1.62E 03	1.53E 03	1.00E 00	1.00E 00
11	0.29750	1.29E 03	1.51E 03	1.70E 03	1.84E 03	1.92E 03	1.94E 03	1.89E 03	1.81E 03	1.71E 03	1.62E 03	1.00E 00	1.00E 00
10	0.27500	1.22E 03	1.46E 03	1.67E 03	1.84E 03	1.94E 03	1.98E 03	1.94E 03	1.86E 03	1.77E 03	1.68E 03	1.00E 00	1.00E 00
9	0.25750	1.15E 03	1.40E 03	1.64E 03	1.82E 03	1.94E 03	1.99E 03	1.97E 03	1.90E 03	1.80E 03	1.72E 03	1.00E 00	1.00E 00
8	0.24250	1.08E 03	1.34E 03	1.59E 03	1.80E 03	1.94E 03	2.01E 03	1.99E 03	1.92E 03	1.83E 03	1.74E 03	1.00E 00	1.00E 00
7	0.21500	9.42E 02	1.22E 03	1.50E 03	1.74E 03	1.92E 03	2.01E 03	2.02E 03	1.96E 03	1.87E 03	1.78E 03	1.00E 00	1.00E 00
6	0.17500	7.80E 02	1.03E 03	1.33E 03	1.61E 03	1.85E 03	1.99E 03	2.04E 03	2.00E 03	1.92E 03	1.83E 03	1.00E 00	1.00E 00
5	0.13000	4.66E 02	7.89E 02	1.09E 03	1.43E 03	1.73E 03	1.95E 03	2.05E 03	2.04E 03	1.96E 03	1.86E 03	1.00E 00	1.00E 00
4	0.08500	2.82E 01	3.90E 02	8.09E 02	1.19E 03	1.57E 03	1.89E 03	2.05E 03	2.07E 03	1.99E 03	1.89E 03	1.00E 00	1.00E 00
3	0.04500	5.50E 00	3.30E 01	4.67E 02	9.33E 02	1.44E 03	1.86E 03	2.08E 03	2.10E 03	2.02E 03	1.91E 03	1.00E 00	1.00E 00
2	0.01250	5.50E 00	5.93E 00	2.26E 02	9.78E 02	1.58E 03	2.00E 03	2.17E 03	2.15E 03	2.05E 03	1.92E 03	1.00E 00	1.00E 00
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

I	X/D	S.S.COEFF.
2	3.148E-02	2.807E-04

100	0.1111E	00	0.4262E-01	0.3099E	00	0.8115E-01	0.7659E-02	0.2631E	08	0.7240E	01-0.2625E-01	0.1289E	01	0.9520E	03	0.3716E	03
101	0.1069E	00	0.4259E-01	0.3034E	00	0.7953E-01	0.7462E-02	0.2379E	08	0.7193E	01-0.2630E-01	0.1366E	01	0.9520E	03	0.3788E	03
102	0.1028E	00	0.4182E-01	0.2967E	00	0.7780E-01	0.7283E-02	0.2369E	08	0.7145E	01-0.2627E-01	0.1445E	01	0.9520E	03	0.3859E	03
103	0.9922E-01	0.4183E-01	0.2901E	00	0.7611E-01	0.7133E-02	0.2366E	08	0.7097E	01-0.2617E-01	0.1527E	01	0.9520E	03	0.3929E	03	
104	0.9573E-01	0.4101E-01	0.2834E	00	0.7427E-01	0.7017E-02	0.2328E	08	0.7049E	01-0.2599E-01	0.1612E	01	0.9521E	03	0.3997E	03	
105	0.9240E-01	0.4085E-01	0.2767E	00	0.7238E-01	0.6913E-02	0.2287E	08	0.7002E	01-0.2573E-01	0.1699E	01	0.9522E	03	0.4064E	03	
106	0.8905E-01	0.3999E-01	0.2700E	00	0.7045E-01	0.6832E-02	0.2211E	08	0.6954E	01-0.2541E-01	0.1788E	01	0.9523E	03	0.4129E	03	
107	0.8601E-01	0.3967E-01	0.2633E	00	0.6844E-01	0.6757E-02	0.2160E	08	0.6907E	01-0.2501E-01	0.1879E	01	0.9525E	03	0.4193E	03	
108	0.8283E-01	0.3875E-01	0.2567E	00	0.6646E-01	0.6690E-02	0.2066E	08	0.6860E	01-0.2454E-01	0.1972E	01	0.9527E	03	0.4254E	03	
109	0.7982E-01	0.3831E-01	0.2502E	00	0.6453E-01	0.6633E-02	0.1971E	08	0.6814E	01-0.2400E-01	0.2067E	01	0.9529E	03	0.4314E	03	
110	0.7710E-01	0.3736E-01	0.2438E	00	0.6249E-01	0.6582E-02	0.1880E	08	0.6769E	01-0.2340E-01	0.2163E	01	0.9532E	03	0.4372E	03	
111	0.7452E-01	0.3681E-01	0.2374E	00	0.6057E-01	0.6540E-02	0.1788E	08	0.6725E	01-0.2275E-01	0.2260E	01	0.9535E	03	0.4428E	03	
112	0.7183E-01	0.3582E-01	0.2312E	00	0.5864E-01	0.6506E-02	0.1729E	08	0.6682E	01-0.2204E-01	0.2358E	01	0.9539E	03	0.4482E	03	
113	0.6951E-01	0.3520E-01	0.2251E	00	0.5682E-01	0.6471E-02	0.1650E	08	0.6640E	01-0.2128E-01	0.2456E	01	0.9543E	03	0.4534E	03	
114	0.6724E-01	0.3419E-01	0.2192E	00	0.5485E-01	0.6438E-02	0.1587E	08	0.6599E	01-0.2048E-01	0.2555E	01	0.9547E	03	0.4584E	03	
115	0.6497E-01	0.3348E-01	0.2134E	00	0.5308E-01	0.6401E-02	0.1526E	08	0.6560E	01-0.1964E-01	0.2654E	01	0.9551E	03	0.4633E	03	
116	0.6270E-01	0.3245E-01	0.2078E	00	0.5125E-01	0.6366E-02	0.1454E	08	0.6523E	01-0.1877E-01	0.2753E	01	0.9556E	03	0.4679E	03	
117	0.6064E-01	0.3168E-01	0.2023E	00	0.4967E-01	0.6347E-02	0.1354E	08	0.6486E	01-0.1787E-01	0.2852E	01	0.9560E	03	0.4724E	03	
118	0.5860E-01	0.3063E-01	0.1970E	00	0.4792E-01	0.6323E-02	0.1268E	08	0.6452E	01-0.1695E-01	0.2950E	01	0.9566E	03	0.4767E	03	
119	0.5677E-01	0.2982E-01	0.1919E	00	0.4640E-01	0.6286E-02	0.1208E	08	0.6419E	01-0.1602E-01	0.3048E	01	0.9571E	03	0.4809E	03	
120	0.5505E-01	0.2879E-01	0.1869E	00	0.4490E-01	0.6232E-02	0.1104E	08	0.6387E	01-0.1507E-01	0.3146E	01	0.9576E	03	0.4849E	03	
121	0.5334E-01	0.2795E-01	0.1821E	00	0.4349E-01	0.6164E-02	0.1022E	08	0.6358E	01-0.1412E-01	0.3242E	01	0.9582E	03	0.4887E	03	
122	0.5168E-01	0.2693E-01	0.1774E	00	0.4203E-01	0.6090E-02	0.9267E	07	0.6330E	01-0.1317E-01	0.3337E	01	0.9588E	03	0.4924E	03	
123	0.5021E-01	0.2609E-01	0.1729E	00	0.4072E-01	0.6032E-02	0.8293E	07	0.6303E	01-0.1223E-01	0.3431E	01	0.9594E	03	0.4959E	03	
124	0.4879E-01	0.2510E-01	0.1685E	00	0.3941E-01	0.6014E-02	0.7505E	07	0.6279E	01-0.1129E-01	0.3524E	01	0.9600E	03	0.4993E	03	
125	0.4734E-01	0.2430E-01	0.1643E	00	0.3823E-01	0.5988E-02	0.7066E	07	0.6256E	01-0.1036E-01	0.3616E	01	0.9607E	03	0.5025E	03	
126	0.4601E-01	0.2338E-01	0.1603E	00	0.3710E-01	0.5949E-02	0.7899E	07	0.6235E	01-0.9446E-02	0.3706E	01	0.9613E	03	0.5056E	03	
127	0.4476E-01	0.2260E-01	0.1564E	00	0.3591E-01	0.5903E-02	0.8964E	07	0.6215E	01-0.8552E-02	0.3795E	01	0.9620E	03	0.5086E	03	
128	0.4367E-01	0.2173E-01	0.1526E	00	0.3496E-01	0.5851E-02	0.1008E	08	0.6197E	01-0.7679E-02	0.3882E	01	0.9626E	03	0.5114E	03	
129	0.4265E-01	0.2099E-01	0.1490E	00	0.3396E-01	0.5796E-02	0.1093E	08	0.6180E	01-0.6829E-02	0.3968E	01	0.9633E	03	0.5141E	03	
130	0.4166E-01	0.2016E-01	0.1454E	00	0.3297E-01	0.5735E-02	0.1205E	08	0.6165E	01-0.6006E-02	0.4052E	01	0.9640E	03	0.5167E	03	
131	0.4068E-01	0.1945E-01	0.1421E	00	0.3201E-01	0.5677E-02	0.1305E	08	0.6152E	01-0.5211E-02	0.4134E	01	0.9647E	03	0.5192E	03	
132	0.3983E-01	0.1867E-01	0.1388E	00	0.3124E-01	0.5641E-02	0.1366E	08	0.6139E	01-0.4445E-02	0.4215E	01	0.9654E	03	0.5216E	03	
133	0.3903E-01	0.1800E-01	0.1357E	00	0.3036E-01	0.5612E-02	0.1473E	08	0.6129E	01-0.3710E-02	0.4294E	01	0.9661E	03	0.5238E	03	
134	0.3824E-01	0.1727E-01	0.1327E	00	0.2961E-01	0.5574E-02	0.1540E	08	0.6119E	01-0.3007E-02	0.4372E	01	0.9668E	03	0.5260E	03	
135	0.3754E-01	0.1663E-01	0.1298E	00	0.2881E-01	0.5531E-02	0.1629E	08	0.6111E	01-0.2337E-02	0.4447E	01	0.9675E	03	0.5280E	03	
136	0.3690E-01	0.1596E-01	0.1270E	00	0.2814E-01	0.5480E-02	0.1734E	08	0.6104E	01-0.1699E-02	0.4521E	01	0.9682E	03	0.5300E	03	
137	0.3638E-01	0.1537E-01	0.1243E	00	0.2750E-01	0.5430E-02	0.1820E	08	0.6098E	01-0.1096E-02	0.4594E	01	0.9689E	03	0.5318E	03	
138	0.3593E-01	0.1475E-01	0.1217E	00	0.2685E-01	0.5380E-02	0.1878E	08	0.6094E	01-0.5268E-03	0.4665E	01	0.9696E	03	0.5336E	03	
139	0.3552E-01	0.1422E-01	0.1192E	00	0.2621E-01	0.5334E-02	0.1940E	08	0.6090E	01	0.9399E-05	0.4734E	01	0.9703E	03	0.5353E	03
140	0.3521E-01	0.1365E-01	0.1167E	00	0.2558E-01	0.5300E-02	0.2016E	08	0.6087E	01	0.5118E-03	0.4801E	01	0.9711E	03	0.5368E	03
141	0.3489E-01	0.1317E-01	0.1144E	00	0.2505E-01	0.5273E-02	0.2073E	08	0.6086E	01	0.9811E-03	0.4867E	01	0.9718E	03	0.5383E	03
142	0.3459E-01	0.1265E-01	0.1121E	00	0.2452E-01	0.5241E-02	0.2168E	08	0.6085E	01	0.1418E-02	0.4931E	01	0.9725E	03	0.5397E	03
143	0.3434E-01	0.1221E-01	0.1100E	00	0.2402E-01	0.5206E-02	0.2210E	08	0.6085E	01	0.1824E-02	0.4994E	01	0.9732E	03	0.5410E	03
144	0.3415E-01	0.1175E-01	0.1079E	00	0.2360E-01	0.5168E-02	0.2281E	08	0.6086E	01	0.2196E-02	0.5056E	01	0.9739E	03	0.5423E	03
145	0.3401E-01	0.1136E-01	0.1058E	00	0.2309E-01	0.5133E-02	0.2349E	08	0.6087E	01	0.2540E-02	0.5116E	01	0.9746E	03	0.5434E	03
146	0.3388E-01	0.1095E-01	0.1039E	00	0.2266E-01	0.5101E-02	0.2387E	08	0.6090E	01	0.2854E-02	0.5174E	01	0.9753E	03	0.5445E	03
147	0.3377E-01	0.1061E-01	0.1020E	00	0.2225E-01	0.5073E-02	0.2445E	08	0.6093E	01	0.3139E-02	0.5231E	01	0.9760E	03	0.5455E	03
148	0.3362E-01	0.1024E-01	0.1001E	00	0.2184E-01	0.5057E-02	0.2503E	08	0.6096E	01	0.3397E-02	0.5287E	01	0.9767E	03	0.5464E	03
149	0.3345E-01	0.9932E-02	0.9835E-01	0.2150E-01	0.5040E-02	0.2544E	08	0.6100E	01	0.3629E-02	0.5342E	01	0.9774E	03	0.5472E	03	
150	0.3327E-01	0.9607E-02	0.9663E-01	0.2112E-01	0.5018E-02	0.2606E	08	0.6105E	01	0.3836E-02	0.5395E	01	0.9781E	03	0.5480E	03	
151	0.3306E-01	0.9335E-02	0.9497E-01	0.2083E-01	0.4992E-02	0.2633E	08	0.6110E	01	0.4018E-02	0.5447E	01	0.9788E	03	0.5487E	03	
152	0.3283E-01	0.9055E-02	0.9335E-01	0.2045E-01	0.4965E-02	0.2675E	08	0.6115E	01	0.4177E-02	0.5498E	01	0.9795E	03	0.5494E	03	
153	0.3256E-01	0.8830E-02	0.9178E-01	0.2026E-01	0.4934E-02	0.2703E	08	0.6121E	01	0.4314E-02	0.5548E	01	0.9802E	03	0.5499E	03	

0 J	Y															
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	7.58E 02	5.92E 02	5.22E 02	4.68E 02	4.25E 02	3.92E 02	3.71E 02	3.81E 02	3.81E 02	3.81E 02	3.81E 02
19	0.05937	0.00	0.00	0.00	0.00	5.31E 02	8.54E 02	6.99E 02	5.41E 02	4.28E 02	3.51E 02	3.05E 02	3.12E 02	3.12E 02	3.12E 02	3.12E 02
18	0.05594	0.00	0.00	0.00	0.00	9.58E 02	1.07E 03	8.55E 02	6.42E 02	4.82E 02	3.71E 02	3.03E 02	3.22E 02	3.22E 02	3.22E 02	3.22E 02
17	0.05344	0.00	0.00	0.00	6.76E 02	1.43E 03	1.30E 03	9.73E 02	7.09E 02	5.22E 02	3.94E 02	3.27E 02	3.84E 02	3.84E 02	3.84E 02	3.84E 02
16	0.05078	0.00	0.00	0.00	1.28E 03	1.61E 03	1.50E 03	1.07E 03	7.49E 02	5.37E 02	4.01E 02	3.64E 02	4.91E 02	4.91E 02	4.91E 02	4.91E 02
15	0.04812	0.00	0.00	0.00	1.84E 03	2.29E 03	1.72E 03	1.15E 03	7.71E 02	5.32E 02	3.95E 02	4.47E 02	6.55E 02	6.55E 02	6.55E 02	6.55E 02
14	0.04562	0.00	0.00	9.95E 02	3.68E 03	2.87E 03	1.93E 03	1.23E 03	7.89E 02	5.26E 02	4.28E 02	6.21E 02	8.71E 02	8.71E 02	8.71E 02	8.71E 02
13	0.04328	0.00	0.00	2.46E 03	4.50E 03	3.26E 03	2.10E 03	1.31E 03	8.15E 02	5.46E 02	5.88E 02	8.98E 02	1.12E 03	1.12E 03	1.12E 03	1.12E 03
12	0.04094	0.00	0.00	4.74E 03	5.63E 03	3.62E 03	2.27E 03	1.41E 03	8.84E 02	6.87E 02	9.41E 02	1.27E 03	1.40E 03	1.40E 03	1.40E 03	1.40E 03
11	0.03719	0.00	2.02E 03	1.35E 04	7.41E 03	4.06E 03	2.54E 03	1.65E 03	1.22E 03	1.45E 03	1.85E 03	1.96E 03	1.85E 03	1.85E 03	1.85E 03	1.85E 03
10	0.03437	0.00	1.80E 04	1.69E 04	7.91E 03	4.25E 03	2.95E 03	2.23E 03	2.20E 03	2.50E 03	2.57E 03	2.41E 03	2.12E 03	2.12E 03	2.12E 03	2.12E 03
9	0.03219	0.00	3.83E 04	1.96E 04	7.40E 03	4.41E 03	3.59E 03	3.19E 03	3.21E 03	3.23E 03	3.01E 03	2.66E 03	2.26E 03	2.26E 03	2.26E 03	2.26E 03
8	0.03031	4.49E 05	8.12E 04	1.90E 04	6.53E 03	4.92E 03	4.52E 03	4.09E 03	3.96E 03	3.68E 03	3.27E 03	2.81E 03	2.35E 03	2.35E 03	2.35E 03	2.35E 03

10	0.27500	3.39E 05	3.39E 05	3.40E 05	3.40E 05	3.40E 05	3.41E 05	3.41E 05	3.41E 05	3.42E 05	3.42E 05	0.00
9	0.25750	3.34E 05	3.35E 05	3.36E 05	3.37E 05	3.37E 05	3.38E 05	3.39E 05	3.39E 05	3.40E 05	3.40E 05	0.00
8	0.24250	3.30E 05	3.31E 05	3.33E 05	3.34E 05	3.35E 05	3.36E 05	3.37E 05	3.37E 05	3.38E 05	3.39E 05	0.00
7	0.21500	3.22E 05	3.25E 05	3.27E 05	3.29E 05	3.31E 05	3.32E 05	3.33E 05	3.34E 05	3.35E 05	3.37E 05	0.00
6	0.17500	3.12E 05	3.16E 05	3.19E 05	3.22E 05	3.25E 05	3.27E 05	3.29E 05	3.30E 05	3.32E 05	3.34E 05	0.00
5	0.13000	3.01E 05	3.07E 05	3.12E 05	3.16E 05	3.20E 05	3.22E 05	3.25E 05	3.27E 05	3.29E 05	3.31E 05	0.00
4	0.08500	2.93E 05	3.01E 05	3.07E 05	3.12E 05	3.16E 05	3.19E 05	3.22E 05	3.24E 05	3.27E 05	3.29E 05	0.00
3	0.04500	2.89E 05	2.97E 05	3.04E 05	3.09E 05	3.13E 05	3.17E 05	3.20E 05	3.23E 05	3.25E 05	3.28E 05	0.00
2	0.01250	2.87E 05	2.95E 05	3.02E 05	3.08E 05	3.13E 05	3.16E 05	3.20E 05	3.22E 05	3.25E 05	3.27E 05	0.00
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*												
DIMENSIONLESS TURBULENCE ENERGY												
--*-*-*-*-*-*-*-*-*-*-*-*-*-*												
0	I =	1	2	3	4	5	6	7	8	9	10	11
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311
0	J	Y										
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	1.26E-03	1.07E-03	9.83E-04	9.13E-04	8.56E-04	8.11E-04	7.82E-04
19	0.47500	0.00	0.00	0.00	0.00	3.89E-03	5.12E-03	4.38E-03	3.57E-03	2.95E-03	2.51E-03	2.23E-03
18	0.44750	0.00	0.00	0.00	0.00	5.77E-03	5.44E-03	4.70E-03	3.97E-03	3.37E-03	2.90E-03	2.63E-03
17	0.42750	0.00	0.00	0.00	1.85E-03	5.30E-03	5.11E-03	4.39E-03	3.78E-03	3.28E-03	2.88E-03	2.77E-03
16	0.40625	0.00	0.00	0.00	6.54E-03	6.34E-03	5.29E-03	4.27E-03	3.55E-03	3.05E-03	2.69E-03	3.06E-03
15	0.38500	0.00	0.00	0.00	8.30E-03	6.66E-03	5.17E-03	4.04E-03	3.25E-03	2.73E-03	2.47E-03	4.07E-03
14	0.36500	0.00	0.00	2.40E-03	8.57E-03	6.66E-03	5.03E-03	3.85E-03	3.02E-03	2.48E-03	2.69E-03	6.20E-03
13	0.34625	0.00	0.00	9.41E-03	9.58E-03	6.70E-03	4.95E-03	3.78E-03	2.93E-03	2.47E-03	4.31E-03	9.20E-03
12	0.32750	0.00	0.00	1.46E-02	1.01E-02	6.49E-03	4.90E-03	3.88E-03	3.10E-03	3.40E-03	7.64E-03	1.28E-02
11	0.29750	0.00	5.04E-03	1.89E-02	1.00E-02	6.06E-03	5.07E-03	4.52E-03	4.79E-03	8.99E-03	1.50E-02	1.87E-02
10	0.27500	0.00	3.55E-02	2.08E-02	8.50E-03	5.44E-03	5.87E-03	6.77E-03	1.04E-02	1.61E-02	2.03E-02	2.24E-02
9	0.25750	0.00	5.87E-02	1.71E-02	5.50E-03	5.22E-03	7.59E-03	1.10E-02	1.62E-02	2.09E-02	2.36E-02	2.47E-02
8	0.24250	3.00E-02	9.97E-03	4.19E-03	2.78E-03	6.04E-03	1.02E-02	1.52E-02	2.06E-02	2.41E-02	2.58E-02	2.62E-02
7	0.21500	3.00E-02	9.91E-03	4.29E-03	3.37E-03	9.03E-03	1.56E-02	2.35E-02	2.70E-02	2.84E-02	2.88E-02	2.82E-02
6	0.17500	3.00E-02	9.91E-03	4.44E-03	5.07E-03	1.68E-02	3.13E-02	3.19E-02	3.10E-02	3.11E-02	3.07E-02	2.95E-02
5	0.13000	3.00E-02	9.93E-03	4.85E-03	1.02E-02	3.69E-02	3.20E-02	3.15E-02	3.08E-02	3.11E-02	3.06E-02	2.92E-02
4	0.08500	3.00E-02	9.97E-03	6.73E-03	2.49E-02	2.91E-02	2.82E-02	2.92E-02	2.93E-02	2.96E-02	2.93E-02	2.79E-02
3	0.04500	3.00E-02	1.00E-02	1.51E-02	3.89E-02	2.60E-02	2.65E-02	2.77E-02	2.79E-02	2.83E-02	2.80E-02	2.68E-02
2	0.01250	3.00E-02	1.02E-02	3.18E-02	3.40E-02	2.55E-02	2.61E-02	2.73E-02	2.76E-02	2.79E-02	2.76E-02	2.64E-02
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y										
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	9.42E-04	1.17E-03	1.31E-03	1.33E-03	1.29E-03	1.22E-03	1.15E-03	1.09E-03	1.03E-03	1.01E-03	3.00E-02
19	0.47500	3.62E-03	5.06E-03	5.74E-03	5.67E-03	5.16E-03	4.48E-03	3.81E-03	3.24E-03	2.78E-03	2.74E-03	3.00E-02
18	0.44750	5.49E-03	7.51E-03	8.31E-03	8.11E-03	7.33E-03	6.33E-03	5.38E-03	4.60E-03	3.99E-03	4.06E-03	3.00E-02
17	0.42750	7.05E-03	9.11E-03	9.79E-03	9.41E-03	8.45E-03	7.29E-03	6.20E-03	5.33E-03	4.65E-03	4.80E-03	3.00E-02
16	0.40625	8.97E-03	1.09E-02	1.13E-02	1.06E-02	9.47E-03	8.14E-03	6.93E-03	5.97E-03	5.24E-03	5.44E-03	3.00E-02
15	0.38500	1.11E-02	1.27E-02	1.27E-02	1.18E-02	1.04E-02	8.88E-03	7.56E-03	6.53E-03	5.74E-03	5.97E-03	3.00E-02
14	0.36500	1.33E-02	1.43E-02	1.40E-02	1.27E-02	1.11E-02	9.49E-03	8.08E-03	6.98E-03	6.15E-03	6.39E-03	3.00E-02
13	0.34625	1.54E-02	1.58E-02	1.51E-02	1.36E-02	1.18E-02	1.00E-02	8.49E-03	7.34E-03	6.48E-03	6.71E-03	3.00E-02
12	0.32750	1.74E-02	1.73E-02	1.61E-02	1.43E-02	1.23E-02	1.04E-02	8.85E-03	7.65E-03	6.75E-03	6.97E-03	3.00E-02
11	0.29750	2.03E-02	1.93E-02	1.75E-02	1.53E-02	1.31E-02	1.10E-02	9.32E-03	8.04E-03	7.10E-03	7.27E-03	3.00E-02
10	0.27500	2.21E-02	2.04E-02	1.83E-02	1.58E-02	1.35E-02	1.13E-02	9.58E-03	8.27E-03	7.30E-03	7.42E-03	3.00E-02
9	0.25750	2.31E-02	2.11E-02	1.87E-02	1.62E-02	1.37E-02	1.15E-02	9.73E-03	8.40E-03	7.41E-03	7.48E-03	3.00E-02
8	0.24250	2.38E-02	2.16E-02	1.90E-02	1.64E-02	1.38E-02	1.16E-02	9.82E-03	8.47E-03	7.47E-03	7.50E-03	3.00E-02
7	0.21500	2.46E-02	2.21E-02	1.93E-02	1.65E-02	1.40E-02	1.17E-02	9.90E-03	8.53E-03	7.52E-03	7.47E-03	3.00E-02
6	0.17500	2.50E-02	2.22E-02	1.93E-02	1.65E-02	1.39E-02	1.17E-02	9.90E-03	8.53E-03	7.51E-03	7.36E-03	3.00E-02

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

DIMENSIONLESS STREAMLINE PLOT																			
OITER	FIELD VALUES AT MONITORING LOCATION(22, 8)																		
NO	I---	ABSOLUTE	RESIDUAL	SOURCE	SUMS	---	I---	---											
	UMON	VMON	WMON	MASS	TKIN	DISP	U	V	W	P	D								
1	0.1858E-01	0.5481E-02	0.3263E	00	0.4266E-02	0.8002E-02	0.8003E	10	0.6449E	01	0.2087E-02	0.7142E	01	0.1008E	04	0.5421E	03		
2	0.1834E-01	0.2116E	00	0.2914E	00	0.3076E-01	0.1090E-01	0.1089E	11	0.6454E	01	0.1957E-02	0.7159E	01	0.1285E	04	0.5416E	03	
3	0.9687E-01	0.2966E	00	0.2658E	00	0.5350E-01	0.1144E-01	0.1032E	11	0.6455E	01	0.8270E-03	0.7175E	01	0.1617E	04	0.5412E	03	
4	0.2601E	00	0.2640E	00	0.2451E	00	0.4110E-01	0.1072E-01	0.6243E	10	0.6456E	01	0.5264E-03	0.7192E	01	0.1644E	04	0.5409E	03
5	0.2764E	00	0.2809E	00	0.2308E	00	0.5134E-01	0.1281E-01	0.6140E	10	0.6457E	01	0.5040E-03	0.7208E	01	0.1620E	04	0.5406E	03
6	0.3025E	00	0.2946E	00	0.2229E	00	0.5906E-01	0.1424E-01	0.7208E	10	0.6459E	01	0.5156E-03	0.7225E	01	0.1572E	04	0.5403E	03
7	0.3253E	00	0.3002E	00	0.2195E	00	0.6339E-01	0.1522E-01	0.7277E	10	0.6460E	01	0.5369E-03	0.7241E	01	0.1515E	04	0.5401E	03
8	0.3415E	00	0.3003E	00	0.2182E	00	0.6554E-01	0.1564E-01	0.7277E	10	0.6461E	01	0.5603E-03	0.7258E	01	0.1458E	04	0.5399E	03
9	0.3517E	00	0.2984E	00	0.2175E	00	0.6908E-01	0.1583E-01	0.6482E	10	0.6463E	01	0.5848E-03	0.7275E	01	0.1403E	04	0.5397E	03
10	0.3582E	00	0.3014E	00	0.2166E	00	0.7202E-01	0.1602E-01	0.5491E	10	0.6464E	01	0.6091E-03	0.7291E	01	0.1353E	04	0.5395E	03
11	0.3646E	00	0.3080E	00	0.2157E	00	0.7366E-01	0.1623E-01	0.4625E	10	0.6465E	01	0.6342E-03	0.7308E	01	0.1309E	04	0.5393E	03
12	0.3687E	00	0.3137E	00	0.2155E	00	0.7526E-01	0.1659E-01	0.3991E	10	0.6467E	01	0.6610E-03	0.7325E	01	0.1272E	04	0.5392E	03
13	0.3722E	00	0.3185E	00	0.2154E	00	0.7638E-01	0.1702E-01	0.3592E	10	0.6468E	01	0.6893E-03	0.7342E	01	0.1241E	04	0.5391E	03
14	0.3757E	00	0.3221E	00	0.2151E	00	0.7769E-01	0.1752E-01	0.3395E	10	0.6470E	01	0.7193E-03	0.7358E	01	0.1216E	04	0.5389E	03
15	0.3803E	00	0.3241E	00	0.2151E	00	0.7927E-01	0.1817E-01	0.3246E	10	0.6471E	01	0.7510E-03	0.7375E	01	0.1197E	04	0.5388E	03
16	0.3860E	00	0.3253E	00	0.2151E	00	0.8044E-01	0.1886E-01	0.3120E	10	0.6473E	01	0.7840E-03	0.7392E	01	0.1182E	04	0.5387E	03
17	0.3910E	00	0.3256E	00	0.2148E	00	0.8144E-01	0.1974E-01	0.3006E	10	0.6475E	01	0.8177E-03	0.7409E	01	0.1171E	04	0.5387E	03
18	0.3943E	00	0.3241E	00	0.2145E	00	0.8353E-01	0.2151E-01	0.2901E	10	0.6477E	01	0.8515E-03	0.7426E	01	0.1162E	04	0.5386E	03
19	0.3954E	00	0.3216E	00	0.2141E	00	0.8613E-01	0.2340E-01	0.2823E	10	0.6479E	01	0.8859E-03	0.7442E	01	0.1156E	04	0.5385E	03
20	0.3950E	00	0.3188E	00	0.2141E	00	0.8806E-01	0.2514E-01	0.2744E	10	0.6481E	01	0.9199E-03	0.7459E	01	0.1150E	04	0.5385E	03
21	0.3943E	00	0.3142E	00	0.2138E	00	0.8891E-01	0.2666E-01	0.2664E	10	0.6483E	01	0.9529E-03	0.7476E	01	0.1146E	04	0.5385E	03
22	0.3920E	00	0.3087E	00	0.2132E	00	0.8899E-01	0.2783E-01	0.2583E	10	0.6485E	01	0.9851E-03	0.7492E	01	0.1143E	04	0.5385E	03
23	0.3885E	00	0.3029E	00	0.2121E	00	0.8890E-01	0.2880E-01	0.2502E	10	0.6487E	01	0.1016E-02	0.7509E	01	0.1140E	04	0.5385E	03
24	0.3846E	00	0.2975E	00	0.2110E	00	0.8893E-01	0.2955E-01	0.2421E	10	0.6489E	01	0.1045E-02	0.7526E	01	0.1138E	04	0.5385E	03
25	0.3801E	00	0.2923E	00	0.2099E	00	0.8689E-01	0.3002E-01	0.2339E	10	0.6491E	01	0.1070E-02	0.7542E	01	0.1136E	04	0.5386E	03
26	0.3757E	00	0.2874E	00	0.2084E	00	0.8446E-01	0.3022E-01	0.2256E	10	0.6494E	01	0.1092E-02	0.7559E	01	0.1135E	04	0.5387E	03
27	0.3712E	00	0.2814E	00	0.2066E	00	0.8235E-01	0.3054E-01	0.2171E	10	0.6496E	01	0.1110E-02	0.7575E	01	0.1134E	04	0.5388E	03
28	0.3668E	00	0.2757E	00	0.2054E	00	0.7982E-01	0.3067E-01	0.2088E	10	0.6499E	01	0.1122E-02	0.7592E	01	0.1133E	04	0.5390E	03
29	0.3621E	00	0.2706E	00	0.2042E	00	0.7810E-01	0.3076E-01	0.2007E	10	0.6501E	01	0.1127E-02	0.7608E	01	0.1132E	04	0.5392E	03
30	0.3576E	00	0.2657E	00	0.2027E	00	0.7673E-01	0.3076E-01	0.1928E	10	0.6504E	01	0.1122E-02	0.7625E	01	0.1132E	04	0.5395E	03
31	0.3526E	00	0.2608E	00	0.2014E	00	0.7555E-01	0.3077E-01	0.1850E	10	0.6506E	01	0.1106E-02	0.7641E	01	0.1131E	04	0.5399E	03
32	0.3486E	00	0.2552E	00	0.2000E	00	0.7512E-01	0.3102E-01	0.1774E	10	0.6509E	01	0.1078E-02	0.7658E	01	0.1131E	04	0.5404E	03
33	0.3451E	00	0.2494E	00	0.1986E	00	0.7500E-01	0.3118E-01	0.1699E	10	0.6511E	01	0.1032E-02	0.7674E	01	0.1130E	04	0.5409E	03
34	0.3406E	00	0.2440E	00	0.1975E	00	0.7544E-01	0.3137E-01	0.1625E	10	0.6514E	01	0.9685E-03	0.7690E	01	0.1129E	04	0.5416E	03
35	0.3358E	00	0.2386E	00	0.1963E	00	0.7614E-01	0.3165E-01	0.1551E	10	0.6516E	01	0.8828E-03	0.7706E	01	0.1128E	04	0.5424E	03
36	0.3311E	00	0.2331E	00	0.1948E	00	0.7718E-01	0.3201E-01	0.1477E	10	0.6519E	01	0.7733E-03	0.7723E	01	0.1128E	04	0.5433E	03
37	0.3264E	00	0.2278E	00	0.1931E	00	0.7822E-01	0.3235E-01	0.1404E	10	0.6521E	01	0.6360E-03	0.7739E	01	0.1127E	04	0.5444E	03
38	0.3215E	00	0.2225E	00	0.1916E	00	0.7959E-01	0.3267E-01	0.1336E	10	0.6523E	01	0.4696E-03	0.7755E	01	0.1126E	04	0.5457E	03
39	0.3162E	00	0.2177E	00	0.1903E	00	0.8126E-01	0.3306E-01	0.1271E	10	0.6525E	01	0.2702E-03	0.7772E	01	0.1126E	04	0.5472E	03
40	0.3110E	00	0.2126E	00	0.1887E	00	0.8317E-01	0.3339E-01	0.1205E	10	0.6527E	01	0.3428E-04	0.7788E	01	0.1125E	04	0.5489E	03
41	0.3058E	00	0.2072E	00	0.1868E	00	0.8461E-01	0.3358E-01	0.1133E	10	0.6528E	01	0.2246E-03	0.7805E	01	0.1125E	04	0.5508E	03
42	0.3016E	00	0.2009E	00	0.1849E	00	0.8547E-01	0.3370E-01	0.1057E	10	0.6530E	01	0.5077E-03	0.7821E	01	0.1125E	04	0.5530E	03
43	0.2971E	00	0.1959E	00	0.1831E	00	0.8670E-01	0.3379E-01	0.9826E	09	0.6530E	01	0.8153E-03	0.7838E	01	0.1125E	04	0.5554E	03
44	0.2923E	00	0.1913E	00	0.1820E	00	0.8785E-01	0.3379E-01	0.9113E	09	0.6531E	01	0.1146E-02	0.7855E	01	0.1125E	04	0.5580E	03
45	0.2877E	00	0.1868E	00	0.1807E	00	0.8892E-01	0.3370E-01	0.8448E	09	0.6531E	01	0.1501E-02	0.7872E	01	0.1125E	04	0.5610E	03
46	0.2832E	00	0.1822E	00	0.1790E	00	0.8997E-01	0.3355E-01	0.7828E	09	0.6530E	01	0.1877E-02	0.7889E	01	0.1126E	04	0.5643E	03

21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.20E 03	1.22E 03	1.17E 03	1.15E 03	1.15E 03	1.16E 03	1.17E 03	1.18E 03		
19	0.05937	0.00	0.00	0.00	0.00	1.18E 03	1.20E 03	1.15E 03	1.14E 03	1.14E 03	1.15E 03	1.16E 03	1.17E 03		
18	0.05594	0.00	0.00	0.00	0.00	1.13E 03	1.17E 03	1.13E 03	1.12E 03	1.12E 03	1.14E 03	1.14E 03	1.15E 03		
17	0.05344	0.00	0.00	0.00	1.18E 03	1.12E 03	1.14E 03	1.11E 03	1.10E 03	1.11E 03	1.12E 03	1.13E 03	1.13E 03		
16	0.05078	0.00	0.00	0.00	1.12E 03	1.12E 03	1.11E 03	1.08E 03	1.08E 03	1.09E 03	1.10E 03	1.11E 03	1.11E 03		
15	0.04812	0.00	0.00	0.00	1.05E 03	1.09E 03	1.07E 03	1.06E 03	1.06E 03	1.08E 03	1.09E 03	1.09E 03	1.09E 03		
14	0.04562	0.00	0.00	1.13E 03	1.03E 03	1.06E 03	1.04E 03	1.03E 03	1.04E 03	1.06E 03	1.07E 03	1.07E 03	1.07E 03		
13	0.04328	0.00	0.00	1.06E 03	1.03E 03	1.02E 03	1.01E 03	1.01E 03	1.02E 03	1.04E 03	1.04E 03	1.05E 03	1.05E 03		
12	0.04094	0.00	0.00	9.47E 02	9.97E 02	9.86E 02	9.76E 02	9.81E 02	1.00E 03	1.01E 03	1.02E 03	1.02E 03	1.02E 03		
11	0.03719	0.00	7.80E 02	8.43E 02	9.29E 02	9.28E 02	9.23E 02	9.38E 02	9.59E 02	9.72E 02	9.79E 02	9.83E 02	9.86E 02		
10	0.03437	0.00	6.20E 02	8.03E 02	8.77E 02	8.81E 02	8.83E 02	9.04E 02	9.24E 02	9.37E 02	9.45E 02	9.51E 02	9.57E 02		
9	0.03219	0.00	4.38E 02	7.61E 02	8.37E 02	8.45E 02	8.53E 02	8.76E 02	8.95E 02	9.08E 02	9.18E 02	9.26E 02	9.34E 02		
8	0.03031	0.00	3.80E 02	7.13E 02	8.06E 02	8.19E 02	8.28E 02	8.51E 02	8.69E 02	8.83E 02	8.94E 02	9.04E 02	9.14E 02		
7	0.02687	0.00	4.41E 02	6.55E 02	7.51E 02	7.69E 02	7.84E 02	8.03E 02	8.20E 02	8.35E 02	8.50E 02	8.64E 02	8.78E 02		
6	0.02187	0.00	4.56E 02	5.94E 02	6.74E 02	6.93E 02	7.13E 02	7.30E 02	7.48E 02	7.67E 02	7.88E 02	8.09E 02	8.29E 02		
5	0.01625	0.00	4.09E 02	5.25E 02	5.86E 02	6.19E 02	6.35E 02	6.53E 02	6.75E 02	6.99E 02	7.26E 02	7.54E 02	7.81E 02		
4	0.01062	0.00	2.99E 02	4.54E 02	5.22E 02	5.46E 02	5.69E 02	5.92E 02	6.17E 02	6.46E 02	6.79E 02	7.12E 02	7.44E 02		
3	0.00562	0.00	1.18E 02	3.94E 02	4.43E 02	4.96E 02	5.28E 02	5.55E 02	5.84E 02	6.16E 02	6.51E 02	6.88E 02	7.23E 02		
2	0.00156	0.00	0.00	3.67E 02	4.24E 02	4.77E 02	5.12E 02	5.42E 02	5.71E 02	6.04E 02	6.41E 02	6.79E 02	7.15E 02		
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y														
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
20	0.06187	1.19E 03	1.19E 03	1.19E 03	1.19E 03	1.19E 03	1.19E 03	1.18E 03	1.18E 03	1.17E 03	1.17E 03			0.00	
19	0.05937	1.17E 03	1.17E 03	1.17E 03	1.17E 03	1.17E 03	1.17E 03	1.16E 03	1.16E 03	1.15E 03	1.15E 03			0.00	
18	0.05594	1.15E 03	1.15E 03	1.15E 03	1.14E 03	1.14E 03	1.14E 03	1.13E 03	1.13E 03	1.13E 03	1.12E 03			0.00	
17	0.05344	1.13E 03	1.13E 03	1.13E 03	1.12E 03	1.12E 03	1.12E 03	1.11E 03	1.11E 03	1.10E 03	1.10E 03			0.00	
16	0.05078	1.11E 03	1.11E 03	1.10E 03	1.10E 03	1.10E 03	1.09E 03	1.09E 03	1.09E 03	1.08E 03	1.08E 03			0.00	
15	0.04812	1.09E 03	1.08E 03	1.08E 03	1.08E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.06E 03	1.06E 03			0.00	
14	0.04562	1.07E 03	1.06E 03	1.06E 03	1.06E 03	1.05E 03	1.05E 03	1.05E 03	1.05E 03	1.05E 03	1.04E 03			0.00	
13	0.04328	1.05E 03	1.04E 03	1.04E 03	1.04E 03	1.04E 03	1.03E 03	1.03E 03	1.03E 03	1.03E 03	1.03E 03			0.00	
12	0.04094	1.02E 03	1.02E 03	1.02E 03	1.02E 03	1.02E 03	1.02E 03	1.01E 03	1.01E 03	1.01E 03	1.01E 03			0.00	
11	0.03719	9.88E 02	9.89E 02	9.89E 02	9.88E 02	9.88E 02	9.88E 02	9.88E 02	9.88E 02	9.88E 02	9.89E 02	9.89E 02		0.00	
10	0.03437	9.61E 02	9.64E 02	9.66E 02	9.67E 02	9.68E 02	9.69E 02	9.70E 02	9.71E 02	9.72E 02	9.73E 02			0.00	
9	0.03219	9.40E 02	9.45E 02	9.48E 02	9.51E 02	9.52E 02	9.54E 02	9.56E 02	9.58E 02	9.60E 02	9.62E 02			0.00	
8	0.03031	9.22E 02	9.29E 02	9.34E 02	9.37E 02	9.40E 02	9.43E 02	9.45E 02	9.48E 02	9.50E 02	9.52E 02			0.00	
7	0.02687	8.91E 02	9.00E 02	9.08E 02	9.14E 02	9.18E 02	9.23E 02	9.27E 02	9.30E 02	9.33E 02	9.37E 02			0.00	
6	0.02187	8.47E 02	8.62E 02	8.74E 02	8.83E 02	8.91E 02	8.97E 02	9.03E 02	9.08E 02	9.13E 02	9.17E 02			0.00	
5	0.01625	8.05E 02	8.26E 02	8.42E 02	8.55E 02	8.65E 02	8.74E 02	8.82E 02	8.88E 02	8.94E 02	9.00E 02			0.00	
4	0.01062	7.73E 02	7.98E 02	8.18E 02	8.34E 02	8.47E 02	8.57E 02	8.66E 02	8.74E 02	8.80E 02	8.87E 02			0.00	
3	0.00562	7.55E 02	7.82E 02	8.05E 02	8.22E 02	8.36E 02	8.48E 02	8.58E 02	8.66E 02	8.73E 02	8.80E 02			0.00	
2	0.00156	7.48E 02	7.77E 02	8.00E 02	8.18E 02	8.32E 02	8.44E 02	8.55E 02	8.63E 02	8.70E 02	8.78E 02			0.00	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y														
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	-1.38E-03	-2.87E-03	8.58E-05	1.85E-03	3.49E-03	5.45E-03	9.37E-03	1.53E-02		
19	0.05937	0.00	0.00	0.00	0.00	-1.03E-03	-2.77E-03	-8.45E-05	1.54E-03	3.30E-03	5.17E-03	9.46E-03	1.57E-02		
18	0.05594	0.00	0.00	0.00	0.00	-2.03E-04	-2.70E-03	7.69E-05	1.41E-03	3.13E-03	4.84E-03	9.24E-03	1.54E-02		
17	0.05344	0.00	0.00	0.00	-8.41E-03	-1.78E-03	-2.00E-03	2.77E-04	1.28E-03	2.72E-03	4.57E-03	9.08E-03	1.50E-02		

17	0.05344	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.05078	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.04812	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.04562	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.04328	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.04094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.03719	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.03437	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.03219	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.03031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.02687	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.02187	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.01625	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.01062	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00562	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0*-**--**--**--**--**--**--**--**--**--													
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01
19	0.05937	0.00	0.00	0.00	0.00	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01
18	0.05594	0.00	0.00	0.00	0.00	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01
17	0.05344	0.00	0.00	0.00	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01
16	0.05078	0.00	0.00	0.00	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01
15	0.04812	0.00	0.00	0.00	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01
14	0.04562	0.00	0.00	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01
13	0.04328	0.00	0.00	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01	2.70E 01
12	0.04094	0.00	0.00	2.70E 01	2.70E 01	2							

[illegible]

2	0.10000	1.02E-02	1.04E-02	1.06E-02	1.10E-02	1.15E-02	1.23E-02	1.33E-02	1.46E-02	1.57E-02	1.66E-02	1.66E-02	
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*													
	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0	J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	0.00	0.00-7.10E-02	-1.14E-01	-1.39E-01	-1.55E-01	-1.65E-01	-1.67E-01	-1.58E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	0.00-7.13E-02	-1.07E-01	-1.28E-01	-1.42E-01	-1.49E-01	-1.48E-01	-1.38E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	0.00-6.86E-02	-9.26E-02	-1.09E-01	-1.18E-01	-1.22E-01	-1.18E-01	-1.06E-01
17	0.42750	0.00	0.00	0.00	0.00	0.00	0.00-7.60E-02	-6.56E-02	-7.97E-02	-9.03E-02	-9.57E-02	-9.58E-02	-8.96E-02
16	0.40625	0.00	0.00	0.00	0.00	0.00	0.00-6.91E-02	-5.80E-02	-6.22E-02	-6.57E-02	-6.55E-02	-6.11E-02	-5.18E-02
15	0.38500	0.00	0.00	0.00	0.00	0.00	0.00-6.38E-02	-4.65E-02	-3.96E-02	-3.42E-02	-2.72E-02	-1.79E-02	-5.17E-03
14	0.36500	0.00	0.00	0.00	0.00	0.00	0.00-8.81E-02	-6.08E-02	-3.05E-02	-1.08E-02	4.15E-03	1.80E-02	3.21E-02
13	0.34625	0.00	0.00	0.00	0.00	0.00	0.00-8.37E-02	-5.33E-02	-5.56E-03	2.69E-02	5.08E-02	7.06E-02	8.86E-02
12	0.32750	0.00	0.00	0.00	0.00	0.00	0.00-8.17E-02	-3.12E-02	3.83E-02	8.02E-02	1.11E-01	1.35E-01	1.56E-01
11	0.29750	0.00	0.00	0.00	0.00	0.00	0.00-1.66E-01	-7.96E-03	8.97E-02	1.58E-01	2.07E-01	2.43E-01	2.70E-01
10	0.27500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.25750	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.24250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.21500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.17500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.13000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.08500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.04500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	I =	13	14	15	16	17	18	19	20	21	22	23	
0	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299	
0	J	Y											
21	0.50500	0.00	0.00	0.00	0.								

3	9.443E-02	6.627E-05
4	1.643E-01	5.671E-05
5	2.419E-01	5.335E-05
6	3.280E-01	1.702E-04
7	4.235E-01	2.800E-04
8	5.296E-01	3.737E-04
9	6.473E-01	4.566E-04
10	7.780E-01	5.230E-04
11	9.231E-01	5.607E-04
12	1.084E 00	5.500E-04
13	1.263E 00	4.763E-04
14	1.461E 00	3.423E-04
15	1.682E 00	1.704E-04
16	1.926E 00	1.299E-05
17	2.197E 00	1.775E-04
18	2.499E 00	3.070E-04
19	2.833E 00	4.021E-04
20	3.167E 00	4.577E-04
21	3.502E 00	4.831E-04
22	3.836E 00	4.715E-04

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1X-AXIS IS XI

Y-AXES ARE

SYMBOL

MAXIMUM VALUES 0.100E-29 0.191E 00 0.282E 00 0.359E 00 0.431E 00 0.500E 00

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RADIAL POSITION R/D

0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
X	0.00	0	2	4	6	8	1	2	4	6	8	0.00
X	0.02	0	2	4	6	8	1	2	4	6	8	0.02
X	0.04	0	2	4	6	8	1	2	4	6	8	0.04
X	0.06	0	2	4	6	8	1	2	4	6	8	0.06

154	0.3228E-01	0.8589E-02	0.9026E-01	0.1988E-01	0.4902E-02	0.2751E	08	0.6127E	01	0.4431E-02	0.5596E	01	0.9809E	03	0.5504E	03
155	0.3199E-01	0.8393E-02	0.8877E-01	0.1959E-01	0.4870E-02	0.2782E	08	0.6133E	01	0.4528E-02	0.5644E	01	0.9815E	03	0.5509E	03
156	0.3169E-01	0.8193E-02	0.8733E-01	0.1942E-01	0.4841E-02	0.2830E	08	0.6140E	01	0.4607E-02	0.5691E	01	0.9822E	03	0.5513E	03
157	0.3137E-01	0.8029E-02	0.8593E-01	0.1905E-01	0.4817E-02	0.2844E	08	0.6147E	01	0.4668E-02	0.5736E	01	0.9829E	03	0.5517E	03
158	0.3104E-01	0.7853E-02	0.8456E-01	0.1889E-01	0.4801E-02	0.2889E	08	0.6154E	01	0.4714E-02	0.5781E	01	0.9835E	03	0.5519E	03
159	0.3070E-01	0.7706E-02	0.8323E-01	0.1860E-01	0.4780E-02	0.2921E	08	0.6161E	01	0.4744E-02	0.5824E	01	0.9842E	03	0.5522E	03
160	0.3034E-01	0.7564E-02	0.8193E-01	0.1844E-01	0.4756E-02	0.2963E	08	0.6169E	01	0.4760E-02	0.5867E	01	0.9849E	03	0.5524E	03
161	0.2998E-01	0.7445E-02	0.8066E-01	0.1813E-01	0.4729E-02	0.2989E	08	0.6177E	01	0.4763E-02	0.5909E	01	0.9855E	03	0.5525E	03
162	0.2961E-01	0.7324E-02	0.7941E-01	0.1798E-01	0.4697E-02	0.2982E	08	0.6184E	01	0.4755E-02	0.5950E	01	0.9862E	03	0.5527E	03
163	0.2923E-01	0.7228E-02	0.7820E-01	0.1772E-01	0.4662E-02	0.3003E	08	0.6192E	01	0.4735E-02	0.5991E	01	0.9868E	03	0.5527E	03
164	0.2885E-01	0.7129E-02	0.7701E-01	0.1759E-01	0.4624E-02	0.3039E	08	0.6200E	01	0.4705E-02	0.6030E	01	0.9874E	03	0.5527E	03
165	0.2847E-01	0.7051E-02	0.7584E-01	0.1734E-01	0.4583E-02	0.3064E	08	0.6208E	01	0.4667E-02	0.6069E	01	0.9881E	03	0.5527E	03
166	0.2809E-01	0.6980E-02	0.7470E-01	0.1710E-01	0.4539E-02	0.3068E	08	0.6216E	01	0.4619E-02	0.6107E	01	0.9887E	03	0.5527E	03
167	0.2771E-01	0.6913E-02	0.7358E-01	0.1698E-01	0.4492E-02	0.3085E	08	0.6224E	01	0.4566E-02	0.6145E	01	0.9893E	03	0.5526E	03
168	0.2734E-01	0.6853E-02	0.7248E-01	0.1685E-01	0.4443E-02	0.3102E	08	0.6232E	01	0.4505E-02	0.6182E	01	0.9900E	03	0.5525E	03
169	0.2696E-01	0.6805E-02	0.7139E-01	0.1661E-01	0.4391E-02	0.3139E	08	0.6240E	01	0.4440E-02	0.6218E	01	0.9906E	03	0.5524E	03
170	0.2659E-01	0.6754E-02	0.7033E-01	0.1647E-01	0.4337E-02	0.3145E	08	0.6248E	01	0.4368E-02	0.6254E	01	0.9912E	03	0.5522E	03
171	0.2622E-01	0.6707E-02	0.6928E-01	0.1632E-01	0.4281E-02	0.3151E	08	0.6256E	01	0.4293E-02	0.6289E	01	0.9918E	03	0.5520E	03
172	0.2585E-01	0.6660E-02	0.6825E-01	0.1604E-01	0.4224E-02	0.3169E	08	0.6263E	01	0.4214E-02	0.6323E	01	0.9924E	03	0.5518E	03
173	0.2549E-01	0.6624E-02	0.6724E-01	0.1596E-01	0.4165E-02	0.3184E	08	0.6271E	01	0.4133E-02	0.6357E	01	0.9930E	03	0.5516E	03
174	0.2514E-01	0.6575E-02	0.6623E-01	0.1580E-01	0.4104E-02	0.3186E	08	0.6279E	01	0.4049E-02	0.6391E	01	0.9936E	03	0.5514E	03
175	0.2479E-01	0.6546E-02	0.6525E-01	0.1560E-01	0.4042E-02	0.3192E	08	0.6286E	01	0.3963E-02	0.6424E	01	0.9942E	03	0.5511E	03
176	0.2446E-01	0.6501E-02	0.6427E-01	0.1545E-01	0.3979E-02	0.3210E	08	0.6294E	01	0.3876E-02	0.6456E	01	0.9948E	03	0.5508E	03
177	0.2412E-01	0.6464E-02	0.6331E-01	0.1533E-01	0.3915E-02	0.3205E	08	0.6301E	01	0.3790E-02	0.6488E	01	0.9954E	03	0.5505E	03
178	0.2380E-01	0.6434E-02	0.6237E-01	0.1522E-01	0.3849E-02	0.3208E	08	0.6309E	01	0.3703E-02	0.6520E	01	0.9960E	03	0.5502E	03
179	0.2349E-01	0.6390E-02	0.6143E-01	0.1499E-01	0.3784E-02	0.3241E	08	0.6316E	01	0.3617E-02	0.6551E	01	0.9965E	03	0.5499E	03
180	0.2318E-01	0.6360E-02	0.6051E-01	0.1489E-01	0.3718E-02	0.3235E	08	0.6323E	01	0.3532E-02	0.6582E	01	0.9971E	03	0.5496E	03
181	0.2288E-01	0.6321E-02	0.5960E-01	0.1475E-01	0.3651E-02	0.3219E	08	0.6330E	01	0.3446E-02	0.6612E	01	0.9977E	03	0.5493E	03
182	0.2259E-01	0.6292E-02	0.5870E-01	0.1458E-01	0.3584E-02	0.3238E	08	0.6337E	01	0.3364E-02	0.6642E	01	0.9982E	03	0.5489E	03
183	0.2231E-01	0.6249E-02	0.5781E-01	0.1449E-01	0.3517E-02	0.3235E	08	0.6344E	01	0.3284E-02	0.6672E	01	0.9988E	03	0.5486E	03
184	0.2204E-01	0.6224E-02	0.5693E-01	0.1426E-01	0.3450E-02	0.3221E	08	0.6350E	01	0.3206E-02	0.6701E	01	0.9994E	03	0.5482E	03
185	0.2178E-01	0.6180E-02	0.5606E-01	0.1419E-01	0.3382E-02	0.3225E	08	0.6357E	01	0.3130E-02	0.6730E	01	0.9999E	03	0.5479E	03
186	0.2153E-01	0.6149E-02	0.5520E-01	0.1405E-01	0.3315E-02	0.3230E	08	0.6363E	01	0.3056E-02	0.6759E	01	0.1000E	04	0.5475E	03
187	0.2128E-01	0.6104E-02	0.5435E-01	0.1387E-01	0.3249E-02	0.3228E	08	0.6370E	01	0.2986E-02	0.6787E	01	0.1001E	04	0.5471E	03
188	0.2104E-01	0.6077E-02	0.5352E-01	0.1374E-01	0.3182E-02	0.3224E	08	0.6376E	01	0.2920E-02	0.6815E	01	0.1002E	04	0.5468E	03
189	0.2082E-01	0.6030E-02	0.5269E-01	0.1357E-01	0.3116E-02	0.3231E	08	0.6382E	01	0.2856E-02	0.6843E	01	0.1002E	04	0.5464E	03
190	0.2060E-01	0.5996E-02	0.5187E-01	0.1344E-01	0.3051E-02	0.3220E	08	0.6388E	01	0.2795E-02	0.6870E	01	0.1003E	04	0.5461E	03
191	0.2039E-01	0.5951E-02	0.5107E-01	0.1331E-01	0.2986E-02	0.3236E	08	0.6394E	01	0.2737E-02	0.6897E	01	0.1003E	04	0.5457E	03
192	0.2018E-01	0.5913E-02	0.5027E-01	0.1316E-01	0.2921E-02	0.3212E	08	0.6400E	01	0.2683E-02	0.6923E	01	0.1004E	04	0.5453E	03
193	0.1998E-01	0.5867E-02	0.4948E-01	0.1309E-01	0.2858E-02	0.3218E	08	0.6406E	01	0.2633E-02	0.6950E	01	0.1004E	04	0.5450E	03
194	0.1979E-01	0.5827E-02	0.4871E-01	0.1292E-01	0.2795E-02	0.3206E	08	0.6412E	01	0.2586E-02	0.6976E	01	0.1005E	04	0.5446E	03
195	0.1960E-01	0.5782E-02	0.4794E-01	0.1279E-01	0.2733E-02	0.3204E	08	0.6418E	01	0.2543E-02	0.7002E	01	0.1005E	04	0.5443E	03
196	0.1942E-01	0.5736E-02	0.4718E-01	0.1265E-01	0.2672E-02	0.3192E	08	0.6423E	01	0.2502E-02	0.7027E	01	0.1006E	04	0.5439E	03
197	0.1924E-01	0.5689E-02	0.4644E-01	0.1247E-01	0.2611E-02	0.3197E	08	0.6429E	01	0.2466E-02	0.7052E	01	0.1006E	04	0.5436E	03
198	0.1907E-01	0.5640E-02	0.4571E-01	0.1247E-01	0.2552E-02	0.3177E	08	0.6434E	01	0.2432E-02	0.7077E	01	0.1007E	04	0.5432E	03
199	0.1891E-01	0.5590E-02	0.4498E-01	0.1232E-01	0.2494E-02	0.3169E	08	0.6440E	01	0.2401E-02	0.7102E	01	0.1007E	04	0.5429E	03
200	0.1874E-01	0.5541E-02	0.4427E-01	0.1216E-01	0.2436E-02	0.3169E	08	0.6445E	01	0.2373E-02	0.7126E	01	0.1008E	04	0.5426E	03

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SWIRL CASE WITH LFS = 2
AND NSBR = 0

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 0.500

7	0.02687	4.49E 05	8.08E 04	1.96E 04	7.35E 03	6.44E 03	6.38E 03	5.68E 03	4.78E 03	4.10E 03	3.51E 03	2.95E 03	2.42E 03
6	0.02187	4.49E 05	8.09E 04	2.02E 04	9.07E 03	1.01E 04	1.14E 04	5.95E 03	4.72E 03	4.04E 03	3.46E 03	2.89E 03	2.35E 03
5	0.01625	4.49E 05	8.10E 04	2.10E 04	1.27E 04	1.91E 04	7.00E 03	4.69E 03	3.95E 03	3.52E 03	3.09E 03	2.61E 03	2.13E 03
4	0.01062	4.49E 05	8.13E 04	2.38E 04	2.08E 04	7.11E 03	4.25E 03	3.55E 03	3.19E 03	2.95E 03	2.64E 03	2.26E 03	1.87E 03
3	0.00562	4.49E 05	8.17E 04	3.14E 04	1.10E 04	4.19E 03	3.17E 03	2.90E 03	2.70E 03	2.54E 03	2.32E 03	2.01E 03	1.69E 03
2	0.00156	4.49E 05	8.25E 04	3.11E 04	6.44E 03	3.17E 03	2.71E 03	2.59E 03	2.44E 03	2.32E 03	2.14E 03	1.87E 03	1.58E 03
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127	
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	4.90E 02	6.76E 02	8.00E 02	8.26E 02	7.90E 02	7.26E 02	6.62E 02	6.07E 02	5.61E 02	5.43E 02	4.49E 05	
19	0.05937	4.25E 02	5.73E 02	6.57E 02	6.59E 02	6.08E 02	5.34E 02	4.60E 02	3.98E 02	3.46E 02	3.37E 02	4.49E 05	
18	0.05594	4.49E 02	5.73E 02	6.23E 02	6.02E 02	5.36E 02	4.55E 02	3.78E 02	3.16E 02	2.67E 02	2.68E 02	4.49E 05	
17	0.05344	5.23E 02	6.24E 02	6.45E 02	6.01E 02	5.22E 02	4.34E 02	3.55E 02	2.92E 02	2.45E 02	2.51E 02	4.49E 05	
16	0.05078	6.44E 02	7.15E 02	6.98E 02	6.25E 02	5.27E 02	4.29E 02	3.46E 02	2.82E 02	2.35E 02	2.45E 02	4.49E 05	
15	0.04812	8.03E 02	8.30E 02	7.68E 02	6.61E 02	5.43E 02	4.34E 02	3.45E 02	2.80E 02	2.32E 02	2.43E 02	4.49E 05	
14	0.04562	9.81E 02	9.51E 02	8.41E 02	7.01E 02	5.62E 02	4.42E 02	3.48E 02	2.80E 02	2.32E 02	2.43E 02	4.49E 05	
13	0.04328	1.16E 03	1.07E 03	9.10E 02	7.39E 02	5.82E 02	4.51E 02	3.52E 02	2.82E 02	2.33E 02	2.43E 02	4.49E 05	
12	0.04094	1.35E 03	1.18E 03	9.76E 02	7.74E 02	6.00E 02	4.59E 02	3.56E 02	2.84E 02	2.34E 02	2.43E 02	4.49E 05	
11	0.03719	1.62E 03	1.34E 03	1.06E 03	8.21E 02	6.23E 02	4.70E 02	3.61E 02	2.86E 02	2.35E 02	2.40E 02	4.49E 05	
10	0.03437	1.77E 03	1.43E 03	1.11E 03	8.44E 02	6.34E 02	4.75E 02	3.62E 02	2.86E 02	2.34E 02	2.37E 02	4.49E 05	
9	0.03219	1.85E 03	1.47E 03	1.13E 03	8.54E 02	6.37E 02	4.75E 02	3.61E 02	2.85E 02	2.33E 02	2.33E 02	4.49E 05	
8	0.03031	1.90E 03	1.49E 03	1.14E 03	8.57E 02	6.37E 02	4.74E 02	3.59E 02	2.82E 02	2.30E 02	2.29E 02	4.49E 05	
7	0.02687	1.92E 03	1.49E 03	1.14E 03	8.49E 02	6.30E 02	4.67E 02	3.53E 02	2.77E 02	2.25E 02	2.20E 02	4.49E 05	
6	0.02187	1.86E 03	1.44E 03	1.09E 03	8.16E 02	6.							

5	0.13000	2.44E-02	2.17E-02	1.89E-02	1.62E-02	1.37E-02	1.16E-02	9.80E-03	8.46E-03	7.44E-03	7.20E-03	3.00E-02
4	0.08500	2.35E-02	2.09E-02	1.83E-02	1.58E-02	1.34E-02	1.14E-02	9.67E-03	8.37E-03	7.37E-03	7.04E-03	3.00E-02
3	0.04500	2.28E-02	2.04E-02	1.79E-02	1.55E-02	1.32E-02	1.12E-02	9.59E-03	8.31E-03	7.32E-03	6.94E-03	3.00E-02
2	0.01250	2.25E-02	2.02E-02	1.78E-02	1.54E-02	1.32E-02	1.12E-02	9.59E-03	8.31E-03	7.32E-03	6.93E-03	3.00E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	*--*	--*	--*	--*	--*	--*	--*	--*	--*	--*	--*	--*
	I =	2	3	4	5	6	7	8	9	10	11	12
0	X =	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y										
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	1.85E-01	1.79E-01	1.71E-01	1.62E-01	1.54E-01	1.50E-01	1.62E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	1.62E-01	1.63E-01	1.68E-01	1.75E-01	1.82E-01	1.92E-01	2.52E-01
17	0.05344	0.00	0.00	5.09E-02	1.17E-01	1.22E-01	1.29E-01	1.42E-01	1.55E-01	1.69E-01	1.93E-01	3.13E-01
16	0.05078	0.00	0.00	1.78E-01	1.20E-01	1.11E-01	1.13E-01	1.22E-01	1.35E-01	1.51E-01	2.01E-01	3.86E-01
15	0.04812	0.00	0.00	1.78E-01	1.02E-01	9.37E-02	9.60E-02	1.04E-01	1.16E-01	1.34E-01	2.51E-01	4.68E-01
14	0.04562	0.00	5.09E-02	9.31E-02	8.18E-02	7.98E-02	8.36E-02	9.08E-02	1.02E-01	1.41E-01	3.40E-01	5.37E-01
13	0.04328	0.00	1.60E-01	9.00E-02	7.28E-02	7.17E-02	7.69E-02	8.41E-02	9.69E-02	2.07E-01	4.25E-01	5.88E-01
12	0.04094	0.00	1.60E-01	7.84E-02	6.24E-02	6.52E-02	7.42E-02	8.42E-02	1.25E-01	3.06E-01	4.90E-01	6.27E-01
11	0.03719	7.64E-02	8.31E-02	5.83E-02	5.01E-02	6.13E-02	7.95E-02	1.17E-01	2.55E-01	4.28E-01	5.62E-01	6.74E-01
10	0.03437	1.60E-01	7.64E-02	4.28E-02	4.08E-02	6.59E-02	1.08E-01	2.05E-01	3.54E-01	4.85E-01	6.00E-01	7.04E-01
9	0.03219	1.60E-01	4.92E-02	2.38E-02	3.70E-02	7.96E-02	1.56E-01	2.76E-01	4.04E-01	5.20E-01	6.28E-01	7.27E-01
8	0.03031	5.29E-03	6.18E-03	9.69E-03	4.12E-02	9.91E-02	1.97E-01	3.23E-01	4.40E-01	5.49E-01	6.51E-01	7.46E-01
7	0.02687	5.27E-03	6.19E-03	1.15E-02	5.75E-02	1.32E-01	2.74E-01	4.01E-01	5.03E-01	6.01E-01	6.94E-01	7.83E-01
6	0.02187	5.27E-03	6.32E-03	1.72E-02	9.31E-02	2.10E-01	4.14E-01	4.99E-01	5.86E-01	6.73E-01	7.58E-01	8.39E-01
5	0.01625	5.28E-03	6.94E-03	3.47E-02	1.60E-01	3.53E-01	5.14E-01	5.92E-01	6.71E-01	7.48E-01	8.25E-01	9.00E-01
4	0.01062	5.30E-03	1.00E-02	8.16E-02	3.01E-01	4.80E-01	6.08E-01	6.78E-01	7.48E-01	8.18E-01	8.89E-01	9.59E-01
3	0.00562	5.32E-03	2.56E-02	3.00E-01	4.32E-01	5.87E-01						

47	0.2791E	00	0.1785E	00	0.1769E	00	0.9076E-01	0.3335E-01	0.7250E	09	0.6529E	01-0.2277E-02	0.7906E	01	0.1126E	04	0.5678E	03
48	0.2750E	00	0.1752E	00	0.1749E	00	0.9134E-01	0.3307E-01	0.6710E	09	0.6528E	01-0.2697E-02	0.7924E	01	0.1127E	04	0.5718E	03
49	0.2712E	00	0.1722E	00	0.1731E	00	0.9167E-01	0.3271E-01	0.6202E	09	0.6525E	01-0.3137E-02	0.7942E	01	0.1127E	04	0.5760E	03
50	0.2678E	00	0.1691E	00	0.1716E	00	0.9175E-01	0.3232E-01	0.5727E	09	0.6523E	01-0.3596E-02	0.7961E	01	0.1128E	04	0.5806E	03
51	0.2645E	00	0.1662E	00	0.1702E	00	0.9160E-01	0.3186E-01	0.5283E	09	0.6519E	01-0.4072E-02	0.7980E	01	0.1129E	04	0.5856E	03
52	0.2614E	00	0.1636E	00	0.1685E	00	0.9113E-01	0.3137E-01	0.4900E	09	0.6515E	01-0.4563E-02	0.8000E	01	0.1129E	04	0.5909E	03
53	0.2580E	00	0.1612E	00	0.1664E	00	0.9043E-01	0.3084E-01	0.4558E	09	0.6510E	01-0.5066E-02	0.8020E	01	0.1130E	04	0.5966E	03
54	0.2543E	00	0.1595E	00	0.1639E	00	0.8953E-01	0.3029E-01	0.4230E	09	0.6505E	01-0.5578E-02	0.8042E	01	0.1131E	04	0.6027E	03
55	0.2505E	00	0.1579E	00	0.1613E	00	0.8851E-01	0.2972E-01	0.3928E	09	0.6499E	01-0.6097E-02	0.8064E	01	0.1132E	04	0.6091E	03
56	0.2471E	00	0.1564E	00	0.1586E	00	0.8726E-01	0.2914E-01	0.3640E	09	0.6492E	01-0.6622E-02	0.8087E	01	0.1133E	04	0.6159E	03
57	0.2441E	00	0.1549E	00	0.1561E	00	0.8580E-01	0.2856E-01	0.3370E	09	0.6484E	01-0.7146E-02	0.8111E	01	0.1134E	04	0.6230E	03
58	0.2414E	00	0.1534E	00	0.1540E	00	0.8429E-01	0.2797E-01	0.3119E	09	0.6475E	01-0.7668E-02	0.8136E	01	0.1134E	04	0.6305E	03
59	0.2383E	00	0.1520E	00	0.1517E	00	0.8260E-01	0.2737E-01	0.2879E	09	0.6466E	01-0.8185E-02	0.8162E	01	0.1135E	04	0.6382E	03
60	0.2346E	00	0.1509E	00	0.1491E	00	0.8078E-01	0.2675E-01	0.2660E	09	0.6456E	01-0.8691E-02	0.8189E	01	0.1136E	04	0.6463E	03
61	0.2309E	00	0.1498E	00	0.1463E	00	0.7881E-01	0.2612E-01	0.2453E	09	0.6445E	01-0.9182E-02	0.8217E	01	0.1137E	04	0.6546E	03
62	0.2274E	00	0.1489E	00	0.1432E	00	0.7684E-01	0.2550E-01	0.2270E	09	0.6433E	01-0.9656E-02	0.8247E	01	0.1138E	04	0.6632E	03
63	0.2239E	00	0.1479E	00	0.1400E	00	0.7473E-01	0.2487E-01	0.2112E	09	0.6421E	01-0.1011E-01	0.8277E	01	0.1138E	04	0.6720E	03
64	0.2206E	00	0.1467E	00	0.1365E	00	0.7263E-01	0.2423E-01	0.1960E	09	0.6408E	01-0.1053E-01	0.8309E	01	0.1139E	04	0.6809E	03
65	0.2172E	00	0.1453E	00	0.1331E	00	0.7045E-01	0.2360E-01	0.1819E	09	0.6394E	01-0.1093E-01	0.8343E	01	0.1140E	04	0.6901E	03
66	0.2137E	00	0.1438E	00	0.1298E	00	0.6828E-01	0.2296E-01	0.1690E	09	0.6379E	01-0.1129E-01	0.8377E	01	0.1140E	04	0.6994E	03
67	0.2100E	00	0.1422E	00	0.1268E	00	0.6608E-01	0.2233E-01	0.1569E	09	0.6364E	01-0.1162E-01	0.8413E	01	0.1141E	04	0.7087E	03
68	0.2065E	00	0.1405E	00	0.1236E	00	0.6393E-01	0.2171E-01	0.1459E	09	0.6348E	01-0.1190E-01	0.8451E	01	0.1142E	04	0.7182E	03
69	0.2035E	00	0.1389E	00	0.1203E	00	0.6176E-01	0.2108E-01	0.1355E	09	0.6331E	01-0.1214E-01	0.8489E	01	0.1142E	04	0.7277E	03
70	0.2006E	00	0.1372E	00	0.1168E	00	0.5954E-01	0.2047E-01	0.1261E	09	0.6315E	01-0.1233E-01	0.8529E	01	0.1143E	04	0.7373E	03
71	0.1973E	00	0.1356E	00	0.1133E	00	0.5733E-01	0.1986E-01	0.1173E	09	0.6297E	01-0.1248E-01	0.8570E	01	0.1143E	04	0.7468E	03
72	0.1940E	00	0.1338E	00	0.1098E	00	0.5512E-01	0.1925E-01	0.1093E	09	0.6279E	01-0.1257E-01	0.8612E	01	0.1144E	04	0.7563E	03
73	0.1910E	00	0.1316E	00	0.1062E	00	0.5294E-01	0.1866E-01	0.1019E	09	0.6261E	01-0.1261E-01	0.8655E	01	0.1144E	04	0.7658E	03
74	0.1876E	00	0.1292E	00	0.1026E	00	0.5087E-01	0.1807E-01	0.9501E	08	0.6243E	01-0.1260E-01	0.8699E	01	0.1144E	04	0.7751E	03
75	0.1843E	00	0.1267E	00	0.9894E-01	0.4876E-01	0.1748E-01	0.8910E	08	0.6225E	01-0.1253E-01	0.8744E	01	0.1145E	04	0.7844E	03	
76	0.1813E	00	0.1241E	00	0.9547E-01	0.4678E-01	0.1690E-01	0.8415E	08	0.6206E	01-0.1241E-01	0.8789E	01	0.1145E	04	0.7935E	03	
77	0.1783E	00	0.1215E	00	0.9217E-01	0.4482E-01	0.1633E-01	0.8031E	08	0.6187E	01-0.1224E-01	0.8836E	01	0.1146E	04	0.8025E	03	
78	0.1754E	00	0.1189E	00	0.8885E-01	0.4288E-01	0.1577E-01	0.7693E	08	0.6169E	01-0.1202E-01	0.8882E	01	0.1146E	04	0.8113E	03	
79	0.1723E	00	0.1162E	00	0.8559E-01	0.4100E-01	0.1521E-01	0.7415E	08	0.6150E	01-0.1174E-01	0.8930E	01	0.1146E	04	0.8200E	03	
80	0.1694E	00	0.1135E	00	0.8234E-01	0.3920E-01	0.1466E-01	0.7186E	08	0.6132E	01-0.1142E-01	0.8978E	01	0.1146E	04	0.8285E	03	
81	0.1665E	00	0.1109E	00	0.7910E-01	0.3743E-01	0.1412E-01	0.6990E	08	0.6114E	01-0.1106E-01	0.9025E	01	0.1147E	04	0.8367E	03	
82	0.1635E	00	0.1084E	00	0.7595E-01	0.3575E-01	0.1359E-01	0.6822E	08	0.6096E	01-0.1065E-01	0.9073E	01	0.1147E	04	0.8448E	03	
83	0.1605E	00	0.1057E	00	0.7285E-01	0.3411E-01	0.1306E-01	0.6636E	08	0.6079E	01-0.1021E-01	0.9121E	01	0.1147E	04	0.8527E	03	
84	0.1579E	00	0.1030E	00	0.6982E-01	0.3257E-01	0.1255E-01	0.6516E	08	0.6062E	01-0.9725E-02	0.9169E	01	0.1147E	04	0.8603E	03	
85	0.1553E	00	0.1001E	00	0.6682E-01	0.3107E-01	0.1204E-01	0.6376E	08	0.6046E	01-0.9215E-02	0.9217E	01	0.1148E	04	0.8676E	03	
86	0.1526E	00	0.9718E-01	0.6393E-01	0.2962E-01	0.1155E-01	0.6338E	08	0.6030E	01-0.8678E-02	0.9264E	01	0.1148E	04	0.8748E	03		
87	0.1498E	00	0.9423E-01	0.6116E-01	0.2828E-01	0.1107E-01	0.6286E	08	0.6014E	01-0.8118E-02	0.9310E	01	0.1148E	04	0.8817E	03		
88	0.1471E	00	0.9127E-01	0.5853E-01	0.2692E-01	0.1061E-01	0.6273E	08	0.6000E	01-0.7539E-02	0.9356E	01	0.1148E	04	0.8884E	03		
89	0.1445E	00	0.8831E-01	0.5606E-01	0.2564E-01	0.1016E-01	0.6264E	08	0.5986E	01-0.6946E-02	0.9402E	01	0.1148E	04	0.8948E	03		
90	0.1420E	00	0.8537E-01	0.5367E-01	0.2441E-01	0.9728E-02	0.6237E	08	0.5972E	01-0.6342E-02	0.9446E	01	0.1148E	04	0.9010E	03		
91	0.1396E	00	0.8245E-01	0.5131E-01	0.2332E-01	0.9325E-02	0.6199E	08	0.5960E	01-0.5731E-02	0.9490E	01	0.1149E	04	0.9074E	03		
92	0.1374E	00	0.7959E-01	0.4908E-01	0.2219E-01	0.8847E-02	0.5803E	08	0.5948E	01-0.5149E-02	0.9533E	01	0.1149E	04	0.9133E	03		
93	0.1352E	00	0.7692E-01	0.4697E-01	0.2095E-01	0.8411E-02	0.5643E	08	0.5937E	01-0.4575E-02	0.9575E	01	0.1149E	04	0.9187E	03		
94	0.1330E	00	0.7444E-01	0.4496E-01	0.1992E-01	0.8015E-02	0.5579E	08	0.5926E	01-0.4002E-02	0.9616E	01	0.1149E	04	0.9239E	03		
95	0.1309E	00	0.7195E-01	0.4300E-01	0.1901E-01	0.7655E-02	0.5575E	08	0.5917E	01-0.3426E-02	0.9657E	01	0.1149E	04	0.9287E	03		
96	0.1287E	00	0.6945E-01	0.4110E-01	0.1808E-01	0.7326E-02	0.5559E	08	0.5908E	01-0.2851E-02	0.9696E	01	0.1149E	04	0.9333E	03		
97	0.1266E	00	0.6694E-01	0.3928E-01	0.1724E-01	0.7049E-02	0.5547E	08	0.5900E	01-0.2279E-02	0.9734E	01	0.1150E	04	0.9377E	03		
98	0.1247E	00	0.6445E-01	0.3757E-01	0.1646E-01	0.6814E-02	0.5509E	08	0.5892E	01-0.1712E-02	0.9771E	01	0.1150E	04	0.9418E	03		
99	0.1228E	00	0.6197E-01	0.3600E-01	0.1570E-01	0.6596E-02	0.5476E	08	0.5886E	01-0.1155E-02	0.9807E	01	0.1150E	04	0.9458E	03		
100	0.1210E	00	0.5955E-01	0.3456E-01	0.1498E-01	0.6381E-02	0.5457E	08	0.5880E	01-0.6085E-03	0.9842E	01	0.1150E	04	0.9495E	03		

16	0.05078	0.00	0.00	0.00	-6.19E-03	-3.21E-03	-1.19E-03	5.63E-04	9.58E-04	2.24E-03	4.19E-03	9.01E-03	1.44E-02
15	0.04812	0.00	0.00	0.00	-3.04E-03	-3.72E-03	-5.77E-04	9.51E-04	7.60E-04	1.53E-03	3.81E-03	8.49E-03	1.30E-02
14	0.04562	0.00	0.00	-1.88E-02	-5.08E-03	-3.56E-03	3.91E-05	1.13E-03	3.76E-04	1.07E-03	3.28E-03	7.42E-03	1.10E-02
13	0.04328	0.00	0.00	-1.64E-02	-8.04E-03	-3.88E-03	2.74E-04	1.03E-03	6.08E-05	6.86E-04	2.70E-03	6.22E-03	8.68E-03
12	0.04094	0.00	0.00	-1.29E-02	-9.11E-03	-4.02E-03	4.95E-04	5.52E-04	-6.94E-04	-1.21E-04	1.42E-03	4.12E-03	5.45E-03
11	0.03719	0.00	-2.30E-02	-1.45E-02	-9.62E-03	-4.19E-03	4.64E-05	-7.38E-04	-2.40E-03	-2.39E-03	-2.00E-03	-1.36E-03	-2.15E-03
10	0.03437	0.00	-2.16E-02	-1.94E-02	-1.13E-02	-4.82E-03	-1.45E-03	-2.41E-03	-4.28E-03	-4.99E-03	-5.68E-03	-6.48E-03	-9.41E-03
9	0.03219	0.00	-2.18E-02	-2.26E-02	-1.30E-02	-6.41E-03	-3.24E-03	-4.43E-03	-6.38E-03	-7.54E-03	-9.13E-03	-1.11E-02	-1.57E-02
8	0.03031	0.00	-2.52E-02	-2.62E-02	-1.73E-02	-8.66E-03	-5.65E-03	-6.37E-03	-8.41E-03	-1.02E-02	-1.24E-02	-1.57E-02	-2.16E-02
7	0.02687	0.00	-3.58E-02	-3.29E-02	-2.53E-02	-1.28E-02	-1.18E-02	-1.17E-02	-1.42E-02	-1.70E-02	-2.10E-02	-2.64E-02	-3.45E-02
6	0.02187	0.00	-4.54E-02	-4.39E-02	-3.55E-02	-2.55E-02	-2.32E-02	-2.35E-02	-2.62E-02	-3.07E-02	-3.68E-02	-4.49E-02	-5.55E-02
5	0.01625	0.00	-5.63E-02	-5.57E-02	-5.14E-02	-3.85E-02	-4.01E-02	-4.05E-02	-4.35E-02	-4.88E-02	-5.66E-02	-6.67E-02	-7.89E-02
4	0.01062	0.00	-6.68E-02	-6.79E-02	-6.56E-02	-5.86E-02	-5.78E-02	-5.79E-02	-6.03E-02	-6.57E-02	-7.44E-02	-8.56E-02	-9.87E-02
3	0.00562	0.00	-7.92E-02	-7.90E-02	-7.97E-02	-7.32E-02	-7.04E-02	-6.94E-02	-7.16E-02	-7.67E-02	-8.57E-02	-9.75E-02	-1.11E-01
2	0.00156	0.00	-8.62E-02	-8.40E-02	-8.39E-02	-7.92E-02	-7.53E-02	-7.39E-02	-7.60E-02	-8.10E-02	-9.00E-02	-1.02E-01	-1.16E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

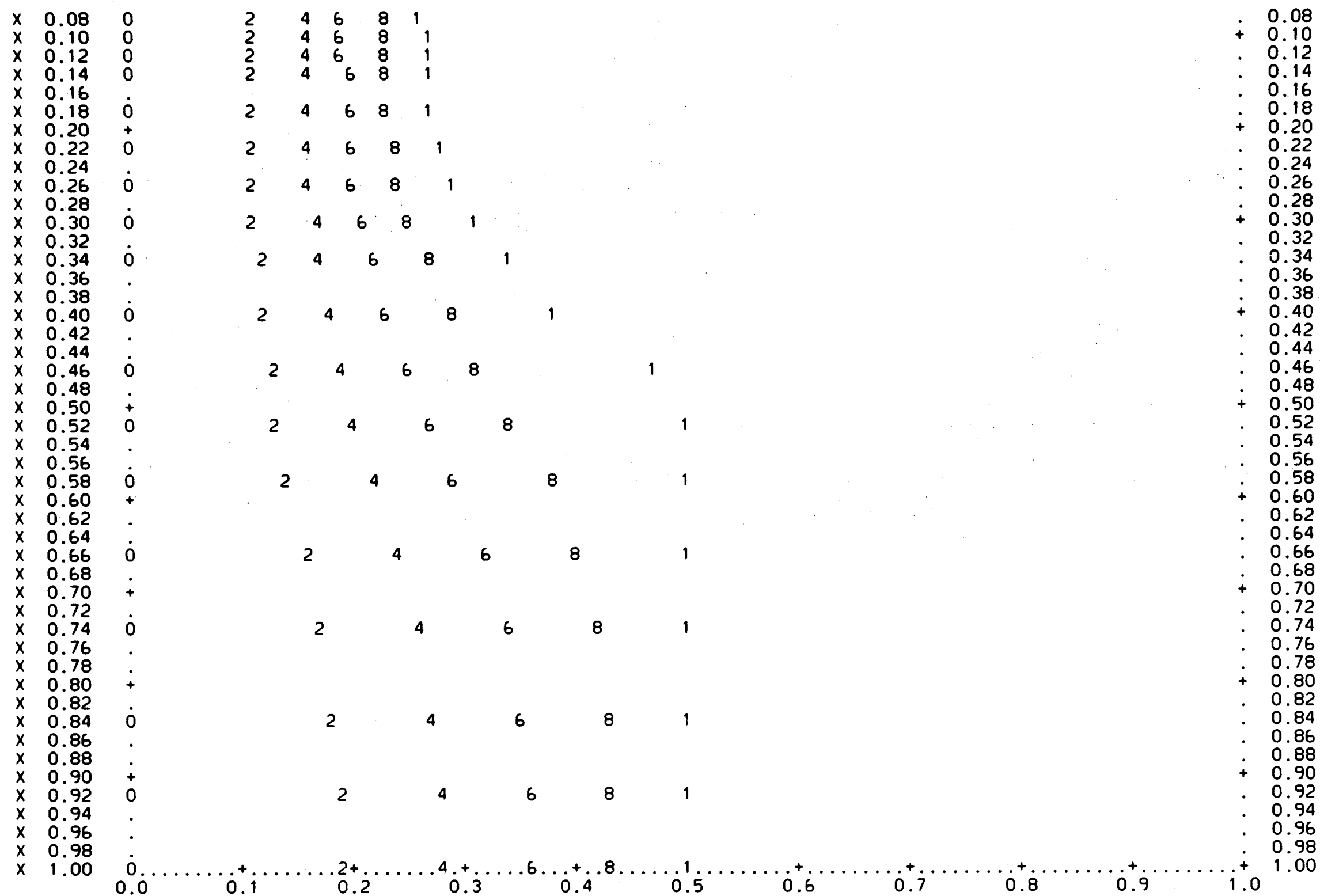
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.40E-02	3.60E-02	4.90E-02	6.22E-02	7.60E-02	9.01E-02	1.04E-01	1.16E-01	1.27E-01	1.39E-01	0.00	0.00
19	0.05937	2.43E-02	3.53E-02	4.68E-02	5.87E-02	7.10E-02	8.38E-02	9.67E-02	1.08E-01	1.18E-01	1.29E-01	0.00	0.00
18	0.05594	2.37E-02	3.33E-02	4.26E-02	5.19E-02	6.16E-02	7.21E-02	8.26E-02	9.20E-02	1.01E-01	1.10E-01	0.00	0.00
17	0.05344	2.29E-02	3.10E-02	3.86E-02	4.58E-02	5.36E-02	6.20E-02	7.05E-02	7.80E-02	8.50E-02	9.20E-02	0.00	0.00
16	0.05078	2.13E-02	2.78E-02	3.34E-02	3.82E-02	4.41E-02	5.00E-02	5.63E-02	6.16E-02	6.69E-02	7.17E-02	0.00	0.00
15	0.04812	1.88E-02	2.35E-02	2.70E-02	2.92E-02	3.31E-02	3.68E-02	4.11E-02	4.42E-02	4.76E-02	5.01E-02	0.00	0.00
14	0.04562	1.57E-02	1.84E-02	1.97E-02	2.00E-02	2.18E-02	2.33E-02	2.58E-02	2.70E-02	2.88E-02	2.92E-02	0.00	0.00
13	0.04328	1.17E-02	1.26E-02	1.21E-02	1.03E-02	1.05E-02	1.02E-02	1.09E-02	1.05E-02	1.05E-02	9.36E-03	0.00	0.00
12	0.04094	6.79E-03	5.59E-03	3.36E-03	-8.24E-05	-1.62E-03	-3.61E-03	-4.35E-03	-6.39E-03	-7.73E-03	-1.06E-02	0.00	0.00
11	0.03719	-3.61E-03	-7.77E-03	-1.25E-02	-1.81E-02	-2.21E-02	-2.63E-02	-2.92E-02	-3.35E-02	-3.66E-02	-4.19E-02	0.00	0.00
10	0.03437	-1.30E-02	-1.92E-02	-2.59E-02	-3.28E-02	-3.82E-02	-4.38E-02	-4.81E-02	-5.36E-02	-5.81E-02	-6.49E-02	0.00	0.00
9	0.03219	-2.13E-02	-2.90E-02	-3.70E-02	-4.48E-02	-5.08E-02	-5.74E-02	-6.27E-02	-6.91E-02	-7.47E-02	-8.21E-02	0.00	0.00
8	0.03031	-2.87E-02	-3.79E-02	-4.68E-02	-5.52E-02	-6.17E-02	-6.90E-02	-7.51E-02	-8.20E-02	-8.86E-02	-9.67E-02	0.00	0.00
7	0.02687	-4.38E-02	-5.46E-02	-6.46E-02	-7.39E-02	-8.11E-02	-8.93E-02	-9.64E-02	-1.04E-01	-1.12E-01	-1.21E-01	0.00	0.00
6	0.02187	-6.69E-02	-7.86E-02	-8.93E-02	-9.90E-02	-1.07E-01	-1.16E-01	-1.24E-01	-1.33E-01	-1.41E-01	-1.51E-01	0.00	0.00
5	0.01625	-9.14E-02	-1.03E-01	-1.14E-01	-1.23E-01	-1.31E-01	-1.41E-01	-1.49E-01	-1.58E-01	-1.67E-01	-1.75E-01	0.00	0.00
4	0.01062	-1.11E-01	-1.23E-01	-1.33E-01	-1.42E-01	-1.50E-01	-1.59E-01	-1.68E-01	-1.77E-01	-1.86E-01	-1.98E-01	0.00	0.00
3	0.00562	-1.23E-01	-1.35E-01	-1.44E-01	-1.52E-01	-1.60E-01	-1.69E-01	-1.79E-01	-1.87E-01	-1.96E-01	-2.09E-01	0.00	0.00
2	0.00156	-1.28E-01	-1.39E-01	-1.48E-01	-1.56E-01	-1.64E-01	-1.73E-01	-1.82E-01	-1.91E-01	-2.00E-01	-2.12E-01	0.00	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	2.68E 00	2.24E 00	1.86E 00	1.61E 00	1.43E 00	1.32E 00	1.39E 00	1.76E 00
19	0.05937	0.00	0.00	0.00	0.00	1.36E 01	1.29E 01	9.95E 00	7.64E 00	5.97E 00	5.01E 00	5.83E 00	8.61E 00
18	0.05594	0.00	0.00	0.00	0.00	1.79E 01	1.33E 01	1.03E 01	8.24E 00	6.77E 00	6.57E 00	9.60E 00	1.38E 01
17	0.05344	0.00	0.00	0.00	6.32E 00	1.05E 01	8.85E 00	7.73E 00	6.97E 00	6.56E 00	8.46E 00	1.33E 01	1.75E 01
16	0.05078	0.00	0.00	0.00	2.04E 01	1.24E 01	8.95E 00	7.21E 00	6.49E 00	7.40E 00	1.22E 01	1.78E 01	2.14E 01
15	0.04812	0.00	0.00	0.00	1.75E 01	1.04E 01	7.82E 00	6.54E 00	6.63E 00	1.06E 01	1.73E 01	2.25E 01	2.51E 01
14	0.04562	0.00	0.00	7.91E 00	1.05E 01	8.68E 00	7.51E 00	6.93E 00	9.10E 00	1.58E 01	2.24E 01	2.66E 01	2.82E 01
13	0.04328	0.00	0.00	2.31E 01	1.20E 01	9.00E 00	8.39E 00	8.94E 00	1.38E 01	2.12E 01	2.69E 01	3.00E 01	3.07E 01
12	0.04094	0.00	0.00	1.88E 01	9.90E 00	9.05E 00	9.85E 00	1.26E 01	1.95E 01	2.63E 01	3.07E 01	3.28E 01	3.28E 01

[illegible]

3	0.00359	5.49E-02	5.62E-02	8.12E-02	1.20E-01	1.44E-01	1.39E-01	1.12E-01	8.35E-02	5.30E-02	7.75E-05	0.00	
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0*-**-*--*--*--*--*--*--*--*--*--*--*--*--*--*													
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.05937	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.05594	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.05344	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.05078	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.04812	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.04562	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.04328	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.04094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.03719	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.03437	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.03219	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.03031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.02687	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.02187	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.01625	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.01062	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00562	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127	
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
19	0.05937	0.00											



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI
Y-AXES ARE

00

02

04

06

08

10

COMPUTED INLET MASS FLOW RATE = 0.01774

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*													U VELOCITY				*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*			
0	I =	1	2	3	4	5	6	7	8	9	10	11	12							
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545							
0 J	Y																			
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
20	0.06187	0.00	0.00	0.00	0.00	0.00	2.09E 00	5.53E 00	7.19E 00	7.63E 00	7.52E 00	7.32E 00	7.26E 00							
19	0.05937	0.00	0.00	0.00	0.00	0.00	3.77E 00	6.51E 00	8.03E 00	8.48E 00	8.41E 00	8.28E 00	8.29E 00							
18	0.05594	0.00	0.00	0.00	0.00	0.00	5.34E 00	7.76E 00	9.03E 00	9.33E 00	9.21E 00	9.07E 00	9.13E 00							
17	0.05344	0.00	0.00	0.00	0.00	4.29E 00	6.42E 00	8.89E 00	9.95E 00	1.01E 01	9.86E 00	9.68E 00	9.71E 00							
16	0.05078	0.00	0.00	0.00	0.00	5.40E 00	7.93E 00	1.01E 01	1.09E 01	1.09E 01	1.06E 01	1.03E 01	1.02E 01							
15	0.04812	0.00	0.00	0.00	0.00	6.58E 00	9.37E 00	1.12E 01	1.18E 01	1.16E 01	1.12E 01	1.09E 01	1.05E 01							
14	0.04562	0.00	0.00	0.00	3.16E 00	7.80E 00	1.07E 01	1.21E 01	1.24E 01	1.20E 01	1.15E 01	1.10E 01	1.05E 01							
13	0.04328	0.00	0.00	0.00	6.03E 00	9.85E 00	1.21E 01	1.28E 01	1.26E 01	1.21E 01	1.15E 01	1.08E 01	1.01E 01							
12	0.04094	0.00	0.00	0.00	8.33E 00	1.17E 01	1.32E 01	1.32E 01	1.25E 01	1.17E 01	1.09E 01	1.02E 01	9.58E 00							
11	0.03719	0.00	0.00	2.89E 00	1.09E 01	1.40E 01	1.43E 01	1.32E 01	1.17E 01	1.01E 01	9.19E 00	8.77E 00	8.45E 00							
10	0.03437	0.00	0.00	1.25E 01	1.59E 01	1.64E 01	1.48E 01	1.23E 01	9.61E 00	8.03E 00	7.63E 00	7.60E 00	7.48E 00							
9	0.03219	0.00	0.00	1.87E 01	1.93E 01	1.75E 01	1.43E 01	1.07E 01	7.49E 00	6.35E 00	6.44E 00	6.66E 00	6.68E 00							
8	0.03031	0.00	3.00E 01	2.39E 01	2.10E 01	1.75E 01	1.32E 01	8.73E 00	5.60E 00	5.00E 00	5.45E 00	5.85E 00	5.98E 00							
7	0.02687	0.00	3.00E 01	2.55E 01	2.16E 01	1.68E 01	1.13E 01	5.16E 00	2.31E 00	2.76E 00	3.71E 00	4.35E 00	4.68E 00							
6	0.02187	0.00	3.00E 01	2.64E 01	2.13E 01	1.44E 01	6.63E 00	-1.31E 00	-1.25E 00	1.20E -01	1.36E 00	2.21E 00	2.80E 00							
5	0.01625	0.00	3.00E 01	2.59E 01	1.87E 01	8.43E 00	-5.97E 00	-5.21E 00	-3.85E 00	-2.34E 00	-1.02E 00	2.78E -02	8.94E -01							
4	0.01062	0.00	3.00E 01	2.31E 01	1.18E 01	-7.34E 00	-8.39E 00	-7.24E 00	-5.72E 00	-4.29E 00	-2.94E 00	-1.70E 00	-5.93E -01							
3	0.00562	0.00	3.00E 01	1.71E 01	-5.82E 00	-1.09E 01	-9.51E 00	-8.26E 00	-6.79E 00	-5.41E 00	-4.05E 00	-2.71E 00	-1.44E 00							
2	0.00156	0.00	3.00E 01	6.81E 00	-1.50E 01	-1.19E 01	-9.92E 00	-8.62E 00	-7.18E 00	-5.82E 00	-4.45E 00	-3.07E 00	-1.74E 00							
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
0	I =	13	14	15	16	17	18	19	20	21	22	23								
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037								
0 J	Y																			

2	0.00156	0.00	2.50E-03	5.67E-04	1.25E-03	9.92E-04	8.27E-04	7.18E-04	5.98E-04	4.85E-04	3.71E-04	2.56E-04	1.45E-04
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037	
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	9.82E-01	9.80E-01	9.79E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01
19	0.05937	8.99E-01	8.94E-01	8.90E-01	8.88E-01	8.88E-01	8.88E-01	8.88E-01	8.88E-01	8.88E-01	8.88E-01	8.88E-01	8.88E-01
18	0.05594	7.79E-01	7.71E-01	7.66E-01	7.65E-01	7.66E-01	7.67E-01	7.69E-01	7.69E-01	7.69E-01	7.69E-01	7.68E-01	7.68E-01
17	0.05344	6.90E-01	6.82E-01	6.78E-01	6.79E-01	6.82E-01	6.85E-01	6.87E-01	6.88E-01	6.88E-01	6.88E-01	6.86E-01	6.86E-01
16	0.05078	5.96E-01	5.91E-01	5.90E-01	5.93E-01	5.98E-01	6.02E-01	6.06E-01	6.07E-01	6.07E-01	6.07E-01	6.06E-01	6.06E-01
15	0.04812	5.06E-01	5.04E-01	5.07E-01	5.13E-01	5.20E-01	5.26E-01	5.30E-01	5.32E-01	5.33E-01	5.33E-01	5.32E-01	5.31E-01
14	0.04562	4.26E-01	4.28E-01	4.35E-01	4.43E-01	4.52E-01	4.59E-01	4.65E-01	4.67E-01	4.68E-01	4.67E-01	4.67E-01	4.67E-01
13	0.04328	3.57E-01	3.63E-01	3.72E-01	3.83E-01	3.94E-01	4.02E-01	4.08E-01	4.11E-01	4.12E-01	4.12E-01	4.12E-01	4.11E-01
12	0.04094	2.95E-01	3.04E-01	3.15E-01	3.28E-01	3.40E-01	3.49E-01	3.56E-01	3.60E-01	3.61E-01	3.61E-01	3.60E-01	3.60E-01
11	0.03719	2.09E-01	2.22E-01	2.36E-01	2.51E-01	2.64E-01	2.74E-01	2.82E-01	2.86E-01	2.88E-01	2.88E-01	2.88E-01	2.87E-01
10	0.03437	1.56E-01	1.71E-01	1.87E-01	2.02E-01	2.16E-01	2.26E-01	2.34E-01	2.38E-01	2.40E-01	2.40E-01	2.40E-01	2.40E-01
9	0.03219	1.21E-01	1.37E-01	1.53E-01	1.69E-01	1.82E-01	1.92E-01	2.00E-01	2.04E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01
8	0.03031	9.63E-02	1.12E-01	1.28E-01	1.44E-01	1.56E-01	1.67E-01	1.74E-01	1.78E-01	1.80E-01	1.80E-01	1.80E-01	1.80E-01
7	0.02687	5.97E-02	7.50E-02	9.01E-02	1.04E-01	1.16E-01	1.25E-01	1.32E-01	1.36E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01
6	0.02187	2.52E-02	3.78E-02	5.01E-02	6.13E-02	7.06E-02	7.78E-02	8.31E-02	8.62E-02	8.78E-02	8.81E-02	8.80E-02	8.80E-02
5	0.01625	6.24E-03	1.46E-02	2.26E-02	2.98E-02	3.57E-02	4.03E-02	4.36E-02	4.56E-02	4.67E-02	4.69E-02	4.69E-02	4.69E-02
4	0.01062	1.59E-04	4.18E-03	7.99E-03	1.14E-02	1.42E-02	1.63E-02	1.79E-02	1.89E-02	1.94E-02	1.95E-02	1.95E-02	1.95E-02
3	0.00562	-3.65E-04	8.37E-04	1.97E-03	2.98E-03	3.80E-03	4.43E-03	4.90E-03	5.18E-03	5.34E-03	5.38E-03	5.37E-03	5.37E-03
2	0.00156	-4.34E-05	5.21E-05	1.42E-04	2.21E-04	2.86E-04	3.37E-04	3.74E-04	3.96E-04	4.08E-			

		X = -0.03148 0.03148 0.09443 0.16430 0.24187 0.32796 0.42352 0.52960 0.64735 0.77804 0.92311 1.08415															
0 J	Y																
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.13E 01	1.05E 01	1.01E 01	9.74E 00	9.46E 00	9.24E 00	9.09E 00	9.16E 00	9.16E 00	9.16E 00
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.41E 02	1.51E 02	1.35E 02	1.17E 02	1.01E 02	8.87E 01	8.13E 01	9.12E 01	9.12E 01	9.12E 01
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.71E 02	1.36E 02	1.27E 02	1.21E 02	1.16E 02	1.12E 02	1.13E 02	1.65E 02	1.65E 02	1.65E 02
17	0.42750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	2.59E 01	9.74E 01	9.99E 01	9.81E 01	9.98E 01	1.02E 02	1.04E 02	1.17E 02	2.33E 02	2.33E 02	2.33E 02
16	0.40625	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.64E 02	1.10E 02	9.22E 01	8.48E 01	8.37E 01	8.58E 01	8.98E 01	1.28E 02	3.35E 02	3.35E 02	3.35E 02
15	0.38500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.85E 02	9.58E 01	7.75E 01	7.03E 01	6.84E 01	6.98E 01	7.67E 01	1.83E 02	4.75E 02	4.75E 02	4.75E 02
14	0.36500	1.00E 00	1.00E 00	1.00E 00	2.93E 01	9.89E 01	7.68E 01	6.52E 01	5.99E 01	5.77E 01	5.84E 01	8.40E 01	3.05E 02	6.28E 02	6.28E 02	6.28E 02	6.28E 02
13	0.34625	1.00E 00	1.00E 00	1.00E 00	1.78E 02	1.01E 02	6.87E 01	5.83E 01	5.47E 01	5.27E 01	5.57E 01	1.56E 02	4.64E 02	7.70E 02	7.70E 02	7.70E 02	7.70E 02
12	0.32750	1.00E 00	1.00E 00	1.00E 00	2.21E 02	9.06E 01	5.81E 01	5.29E 01	5.35E 01	5.42E 01	8.35E 01	3.05E 02	6.29E 02	9.03E 02	9.03E 02	9.03E 02	9.03E 02
11	0.29750	1.00E 00	6.26E 01	1.31E 02	6.71E 01	4.53E 01	5.05E 01	6.17E 01	9.32E 01	2.76E 02	5.95E 02	8.74E 02	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03
10	0.27500	1.00E 00	3.44E 02	1.26E 02	4.58E 01	3.52E 01	5.83E 01	1.02E 02	2.44E 02	5.11E 02	7.85E 02	1.02E 03	1.21E 03	1.21E 03	1.21E 03	1.21E 03	1.21E 03
9	0.25750	1.00E 00	4.42E 02	7.39E 01	2.11E 01	3.13E 01	7.98E 01	1.87E 02	4.00E 02	6.64E 02	9.09E 02	1.12E 03	1.29E 03	1.29E 03	1.29E 03	1.29E 03	1.29E 03
8	0.24250	1.00E 00	7.00E 00	5.54E 00	6.80E 00	3.74E 01	1.15E 02	2.76E 02	5.27E 02	7.78E 02	1.00E 03	1.20E 03	1.35E 03	1.35E 03	1.35E 03	1.35E 03	1.35E 03
7	0.21500	1.00E 00	6.96E 00	5.60E 00	8.59E 00	6.31E 01	1.89E 02	4.79E 02	7.49E 02	9.64E 02	1.16E 03	1.33E 03	1.46E 03	1.46E 03	1.46E 03	1.46E 03	1.46E 03
6	0.17500	1.00E 00	6.96E 00	5.78E 00	1.49E 01	1.38E 02	4.24E 02	8.39E 02	9.99E 02	1.17E 03	1.34E 03	1.48E 03	1.58E 03	1.58E 03	1.58E 03	1.58E 03	1.58E 03
5	0.13000	1.00E 00	6.97E 00	6.49E 00	4.07E 01	3.51E 02	7.17E 02	1.04E 03	1.18E 03	1.34E 03	1.49E 03	1.60E 03	1.68E 03	1.68E 03	1.68E 03	1.68E 03	1.68E 03
4	0.08500	1.00E 00	7.01E 00	1.03E 01	1.47E 02	5.84E 02	9.15E 02	1.18E 03	1.32E 03	1.46E 03	1.59E 03	1.69E 03	1.75E 03	1.75E 03	1.75E 03	1.75E 03	1.75E 03
3	0.04500	1.00E 00	7.06E 00	3.67E 01	6.73E 02	7.91E 02	1.09E 03	1.30E 03	1.42E 03	1.55E 03	1.66E 03	1.75E 03	1.81E 03	1.81E 03	1.81E 03	1.81E 03	1.81E 03
2	0.01250	1.00E 00	7.14E 00	1.60E 02	8.83E 02	1.00E 03	1.24E 03	1.41E 03	1.53E 03	1.65E 03	1.75E 03	1.83E 03	1.88E 03	1.88E 03	1.88E 03	1.88E 03	1.88E 03
1-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015

0 J	Y																
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	9.88E 00	1.09E 01	1.15E 01	1.16E 01	1.14E 01	1.11E 01	1.08E 01	1.05E 01	1.03E 01	1.02E 01	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
19	0.47500	1.53E 02	2.21E 02	2.47E 02	2.40E 02	2.16E 02	1.85E 02	1.55E 02	1.31E 02	1.11E 02	1.10E 02	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
18	0.44750	3.31E 02	4.83E 02	5.45E 02	5.37E 02	4.92E 02	4.34E 02	3.77E 02	3.31E 02	2.94E 02	3.03E 02	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
17	0.42750	4.68E 02	6.54E 02	7.30E 02	7.24E 02	6.71E 02	6.02E 02	5.34E 02	4.78E 02	4.35E 02	4.51E 02	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
16	0.40625	6.14E 02	8.11E 02	8.95E 02	8.91E 02	8.36E 02	7.59E 02	6.84E 02	6.22E 02	5.75E 02	5.95E 02	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
15	0.38500	7.59E 02	9.48E 02	1.03E 03	1.03E 03	9.74E 02	8.94E 02	8.15E 02	7.49E 02	6.99E 02	7.22E 02	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
14	0.36500	8.89E 02	1.06E 03	1.14E 03	1.14E 03	1.08E 03	1.00E 03	9.22E 02	8.54E 02	8.02E 02	8.26E 02	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
13	0.34625	1.00E 03	1.15E 03	1.23E 03	1.22E 03	1.17E 03	1.09E 03	1.01E 03	9.39E 02	8.86E 02	9.10E 02	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
12	0.32750	1.11E 03	1.24E 03	1.30E 03	1.30E 03	1.24E 03	1.16E 03	1.08E 03	1.01E 03	9.59E 02	9.83E 02	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
11	0.29750	1.25E 03	1.36E 03	1.41E 03	1.40E 03	1.34E 03	1.26E 03	1.18E 03	1.11E 03	1.06E 03	1.08E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
10	0.27500	1.35E 03	1.44E 03	1.47E 03	1.46E 03	1.40E 03	1.33E 03	1.25E 03	1.18E 03	1.12E 03	1.14E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
9	0.25750	1.41E 03	1.49E 03	1.52E 03	1.50E 03	1.45E 03	1.37E 03	1.29E 03	1.22E 03	1.16E 03	1.18E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
8	0.24250	1.46E 03	1.53E 03	1.55E 03	1.53E 03	1.48E 03	1.40E 03	1.32E 03	1.25E 03	1.19E 03	1.21E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
7	0.21500	1.55E 03	1.60E 03	1.61E 03	1.58E 03	1.52E 03	1.44E 03	1.36E 03	1.29E 03	1.23E 03	1.25E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
6	0.17500	1.65E 03	1.68E 03	1.68E 03	1.64E 03	1.58E 03	1.50E 03	1.41E 03	1.34E 03	1.28E 03	1.29E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
5	0.13000	1.73E 03	1.75E 03	1.73E 03	1.69E 03	1.62E 03	1.54E 03	1.46E 03	1.39E 03	1.33E 03	1.33E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
4	0.08500	1.79E 03	1.80E 03	1.78E 03	1.73E 03	1.66E 03	1.57E 03	1.49E 03	1.42E 03	1.36E 03	1.36E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
3	0.04500	1.84E 03	1.85E 03	1.82E 03	1.76E 03	1.68E 03	1.60E 03	1.51E 03	1.44E 03	1.38E 03	1.38E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
2	0.01250	1.90E 03	1.90E 03	1.86E 03	1.79E 03	1.71E 03	1.62E 03	1.53E 03	1.46E 03	1.39E 03	1.40E 03	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
1-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

I	X/D	S.S.COEFF.
2	3.148E-02	3.545E-03

101	0.1192E	00	0.5718E-01	0.3320E-01	0.1429E-01	0.6170E-02	0.5412E	08	0.5875E	01	-0.7744E-04	0.9875E	01	0.1150E	04	0.9531E	03
102	0.1176E	00	0.5487E-01	0.3190E-01	0.1367E-01	0.5965E-02	0.5359E	08	0.5871E	01	0.4376E-03	0.9908E	01	0.1150E	04	0.9565E	03
103	0.1160E	00	0.5262E-01	0.3067E-01	0.1307E-01	0.5793E-02	0.5309E	08	0.5867E	01	0.9351E-03	0.9939E	01	0.1150E	04	0.9597E	03
104	0.1144E	00	0.5047E-01	0.2951E-01	0.1248E-01	0.5647E-02	0.5256E	08	0.5865E	01	0.1413E-02	0.9969E	01	0.1150E	04	0.9628E	03
105	0.1129E	00	0.4838E-01	0.2842E-01	0.1192E-01	0.5523E-02	0.5186E	08	0.5862E	01	0.1869E-02	0.9998E	01	0.1150E	04	0.9657E	03
106	0.1114E	00	0.4645E-01	0.2741E-01	0.1144E-01	0.5394E-02	0.5145E	08	0.5861E	01	0.2304E-02	0.1003E	02	0.1151E	04	0.9684E	03
107	0.1101E	00	0.4460E-01	0.2652E-01	0.1093E-01	0.5260E-02	0.5089E	08	0.5860E	01	0.2716E-02	0.1005E	02	0.1151E	04	0.9709E	03
108	0.1087E	00	0.4278E-01	0.2567E-01	0.1044E-01	0.5122E-02	0.5007E	08	0.5860E	01	0.3105E-02	0.1008E	02	0.1151E	04	0.9734E	03
109	0.1074E	00	0.4100E-01	0.2484E-01	0.1000E-01	0.4991E-02	0.4947E	08	0.5861E	01	0.3471E-02	0.1010E	02	0.1151E	04	0.9757E	03
110	0.1061E	00	0.3926E-01	0.2407E-01	0.9578E-02	0.4874E-02	0.4870E	08	0.5862E	01	0.3814E-02	0.1013E	02	0.1151E	04	0.9778E	03
111	0.1048E	00	0.3757E-01	0.2334E-01	0.9157E-02	0.4775E-02	0.4804E	08	0.5864E	01	0.4134E-02	0.1015E	02	0.1151E	04	0.9798E	03
112	0.1036E	00	0.3593E-01	0.2267E-01	0.8816E-02	0.4692E-02	0.4714E	08	0.5866E	01	0.4430E-02	0.1017E	02	0.1151E	04	0.9817E	03
113	0.1024E	00	0.3434E-01	0.2207E-01	0.8446E-02	0.4611E-02	0.4632E	08	0.5869E	01	0.4704E-02	0.1019E	02	0.1151E	04	0.9834E	03
114	0.1011E	00	0.3279E-01	0.2156E-01	0.8085E-02	0.4524E-02	0.4532E	08	0.5873E	01	0.4956E-02	0.1021E	02	0.1151E	04	0.9851E	03
115	0.9975E-01	0.3131E-01	0.2108E-01	0.7786E-02	0.4436E-02	0.4452E	08	0.5877E	01	0.5186E-02	0.1023E	02	0.1151E	04	0.9866E	03	
116	0.9837E-01	0.2997E-01	0.2062E-01	0.7692E-02	0.4437E-02	0.4602E	08	0.5882E	01	0.6268E-02	0.1025E	02	0.1151E	04	0.9879E	03	
117	0.9503E-01	0.3662E-01	0.2024E-01	0.7238E-02	0.4422E-02	0.4671E	08	0.5888E	01	0.6710E-02	0.1027E	02	0.1151E	04	0.9891E	03	
118	0.9398E-01	0.3164E-01	0.1991E-01	0.6970E-02	0.4413E-02	0.4614E	08	0.5894E	01	0.6976E-02	0.1028E	02	0.1152E	04	0.9901E	03	
119	0.9214E-01	0.3045E-01	0.1962E-01	0.6705E-02	0.4407E-02	0.4495E	08	0.5901E	01	0.7133E-02	0.1030E	02	0.1152E	04	0.9910E	03	
120	0.9041E-01	0.2880E-01	0.1942E-01	0.6460E-02	0.4391E-02	0.4353E	08	0.5909E	01	0.7255E-02	0.1031E	02	0.1152E	04	0.9918E	03	
121	0.8853E-01	0.2755E-01	0.1926E-01	0.6268E-02	0.4370E-02	0.4205E	08	0.5917E	01	0.7347E-02	0.1033E	02	0.1152E	04	0.9926E	03	
122	0.8676E-01	0.2622E-01	0.1911E-01	0.6073E-02	0.4346E-02	0.4040E	08	0.5925E	01	0.7421E-02	0.1034E	02	0.1152E	04	0.9932E	03	
123	0.8499E-01	0.2499E-01	0.1901E-01	0.5865E-02	0.4329E-02	0.3905E	08	0.5934E	01	0.7476E-02	0.1035E	02	0.1152E	04	0.9937E	03	
124	0.8322E-01	0.2384E-01	0.1894E-01	0.5716E-02	0.4324E-02	0.3774E	08	0.5943E	01	0.7516E-02	0.1037E	02	0.1152E	04	0.9942E	03	
125	0.8143E-01	0.2284E-01	0.1894E-01	0.5544E-02	0.4322E-02	0.3648E	08	0.5952E	01	0.7540E-02	0.1038E	02	0.1152E	04	0.9946E	03	
126	0.7964E-01	0.2194E-01	0.1897E-01	0.5356E-02	0.4316E-02	0.3490E	08	0.5961E	01	0.7549E-02	0.1039E	02	0.1152E	04	0.9949E	03	
127	0.7786E-01	0.2120E-01	0.1901E-01	0.5507E-02	0.4401E-02	0.3570E	08	0.5972E	01	0.8594E-02	0.1040E	02	0.1152E	04	0.9951E	03	
128	0.7423E-01	0.2712E-01	0.1913E-01	0.5156E-02	0.4479E-02	0.3538E	08	0.5984E	01	0.8843E-02	0.1041E	02	0.1153E	04	0.9951E	03	
129	0.7297E-01	0.2322E-01	0.1928E-01	0.5044E-02	0.4542E-02	0.3426E	08	0.5996E	01	0.8929E-02	0.1042E	02	0.1153E	04	0.9951E	03	
130	0.7071E-01	0.2288E-01	0.1944E-01	0.4922E-02	0.4589E-02	0.3263E	08	0.6008E	01	0.8852E-02	0.1043E	02	0.1153E	04	0.9950E	03	
131	0.6875E-01	0.2171E-01	0.1960E-01	0.4865E-02	0.4623E-02	0.3142E	08	0.6021E	01	0.8751E-02	0.1044E	02	0.1153E	04	0.9948E	03	
132	0.6659E-01	0.2122E-01	0.1978E-01	0.4767E-02	0.4644E-02	0.3003E	08	0.6033E	01	0.8613E-02	0.1045E	02	0.1153E	04	0.9946E	03	
133	0.6458E-01	0.2036E-01	0.1995E-01	0.4679E-02	0.4653E-02	0.2830E	08	0.6045E	01	0.8467E-02	0.1046E	02	0.1153E	04	0.9943E	03	
134	0.6256E-01	0.1970E-01	0.2012E-01	0.4589E-02	0.4663E-02	0.2696E	08	0.6058E	01	0.8311E-02	0.1047E	02	0.1153E	04	0.9940E	03	
135	0.6058E-01	0.1899E-01	0.2030E-01	0.4538E-02	0.4695E-02	0.2573E	08	0.6070E	01	0.8148E-02	0.1048E	02	0.1153E	04	0.9936E	03	
136	0.5863E-01	0.1834E-01	0.2047E-01	0.4436E-02	0.4718E-02	0.2449E	08	0.6082E	01	0.7979E-02	0.1049E	02	0.1154E	04	0.9932E	03	
137	0.5673E-01	0.1766E-01	0.2063E-01	0.4402E-02	0.4733E-02	0.2333E	08	0.6095E	01	0.7805E-02	0.1049E	02	0.1154E	04	0.9927E	03	
138	0.5485E-01	0.1702E-01	0.2079E-01	0.4315E-02	0.4740E-02	0.2226E	08	0.6107E	01	0.7625E-02	0.1050E	02	0.1154E	04	0.9922E	03	
139	0.5302E-01	0.1639E-01	0.2094E-01	0.4283E-02	0.4738E-02	0.2148E	08	0.6119E	01	0.7441E-02	0.1051E	02	0.1154E	04	0.9917E	03	
140	0.5122E-01	0.1577E-01	0.2109E-01	0.4224E-02	0.4731E-02	0.2061E	08	0.6130E	01	0.7252E-02	0.1052E	02	0.1154E	04	0.9911E	03	
141	0.4946E-01	0.1517E-01	0.2123E-01	0.4171E-02	0.4717E-02	0.1970E	08	0.6142E	01	0.7061E-02	0.1052E	02	0.1154E	04	0.9905E	03	
142	0.4774E-01	0.1459E-01	0.2135E-01	0.4161E-02	0.4699E-02	0.1902E	08	0.6153E	01	0.6865E-02	0.1053E	02	0.1154E	04	0.9899E	03	
143	0.4606E-01	0.1404E-01	0.2148E-01	0.4124E-02	0.4674E-02	0.1839E	08	0.6165E	01	0.6667E-02	0.1054E	02	0.1154E	04	0.9893E	03	
144	0.4443E-01	0.1351E-01	0.2159E-01	0.4113E-02	0.4643E-02	0.1737E	08	0.6176E	01	0.6467E-02	0.1055E	02	0.1155E	04	0.9886E	03	
145	0.4284E-01	0.1302E-01	0.2169E-01	0.4052E-02	0.4609E-02	0.1702E	08	0.6187E	01	0.6265E-02	0.1055E	02	0.1155E	04	0.9879E	03	
146	0.4130E-01	0.1254E-01	0.2177E-01	0.4052E-02	0.4570E-02	0.1628E	08	0.6197E	01	0.6063E-02	0.1056E	02	0.1155E	04	0.9872E	03	
147	0.3981E-01	0.1209E-01	0.2185E-01	0.3982E-02	0.4526E-02	0.1548E	08	0.6208E	01	0.5860E-02	0.1057E	02	0.1155E	04	0.9865E	03	
148	0.3838E-01	0.1168E-01	0.2192E-01	0.3976E-02	0.4478E-02	0.1486E	08	0.6218E	01	0.5657E-02	0.1058E	02	0.1155E	04	0.9858E	03	
149	0.3699E-01	0.1127E-01	0.2197E-01	0.3975E-02	0.4427E-02	0.1442E	08	0.6228E	01	0.5454E-02	0.1058E	02	0.1155E	04	0.9851E	03	
150	0.3565E-01	0.1088E-01	0.2202E-01	0.3940E-02	0.4372E-02	0.1377E	08	0.6238E	01	0.5253E-02	0.1059E	02	0.1155E	04	0.9844E	03	
151	0.3435E-01	0.1055E-01	0.2205E-01	0.3964E-02	0.4314E-02	0.1311E	08	0.6247E	01	0.5052E-02	0.1060E	02	0.1156E	04	0.9836E	03	
152	0.3309E-01	0.1024E-01	0.2207E-01	0.3955E-02	0.4253E-02	0.1246E	08	0.6256E	01	0.4854E-02	0.1061E	02	0.1156E	04	0.9829E	03	
153	0.3189E-01	0.9935E-02	0.2208E-01	0.3914E-02	0.4189E-02	0.1197E	08	0.6265E	01	0.4658E-02	0.1061E	02	0.1156E	04	0.9822E	03	
154	0.3073E-01	0.9646E-02	0.2208E-01	0.3899E-02	0.4124E-02	0.1143E	08	0.6274E	01	0.4464E-02	0.1062E	02	0.1156E	04	0.9815E	03	

11	0.03719	0.00	1.13E 01	1.27E 01	8.34E 00	1.01E 01	1.35E 01	2.10E 01	2.85E 01	3.31E 01	3.56E 01	3.64E 01	3.54E 01
10	0.03437	0.00	3.84E 01	1.47E 01	8.29E 00	1.28E 01	2.06E 01	2.76E 01	3.30E 01	3.63E 01	3.79E 01	3.81E 01	3.67E 01
9	0.03219	0.00	4.08E 01	1.02E 01	7.77E 00	1.62E 01	2.53E 01	3.10E 01	3.51E 01	3.78E 01	3.91E 01	3.89E 01	3.73E 01
8	0.03031	2.70E 01	8.98E 00	4.32E 00	8.35E 00	2.02E 01	2.85E 01	3.26E 01	3.61E 01	3.85E 01	3.97E 01	3.94E 01	3.76E 01
7	0.02687	2.70E 01	8.95E 00	4.92E 00	1.15E 01	2.73E 01	3.21E 01	3.41E 01	3.70E 01	3.91E 01	4.01E 01	3.96E 01	3.77E 01
6	0.02187	2.70E 01	8.97E 00	6.59E 00	1.92E 01	4.16E 01	3.27E 01	3.45E 01	3.69E 01	3.88E 01	3.97E 01	3.91E 01	3.72E 01
5	0.01625	2.70E 01	9.03E 00	1.17E 01	3.74E 01	3.29E 01	3.22E 01	3.37E 01	3.58E 01	3.75E 01	3.82E 01	3.76E 01	3.58E 01
4	0.01062	2.70E 01	9.28E 00	2.69E 01	5.82E 01	3.11E 01	3.15E 01	3.27E 01	3.44E 01	3.59E 01	3.66E 01	3.60E 01	3.44E 01
3	0.00562	2.70E 01	1.04E 01	6.47E 01	4.48E 01	3.11E 01	3.10E 01	3.20E 01	3.35E 01	3.49E 01	3.55E 01	3.50E 01	3.34E 01
2	0.00156	2.70E 01	1.78E 01	4.80E 01	4.09E 01	3.10E 01	3.09E 01	3.19E 01	3.33E 01	3.46E 01	3.52E 01	3.47E 01	3.32E 01
1-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.09E 00	2.19E 00	2.12E 00	1.96E 00	1.80E 00	1.65E 00	1.53E 00	1.43E 00	1.35E 00	1.33E 00	2.70E 01	
19	0.05937	1.06E 01	1.09E 01	9.95E 00	8.49E 00	6.97E 00	5.60E 00	4.52E 00	3.71E 00	3.11E 00	3.17E 00	2.70E 01	
18	0.05594	1.61E 01	1.59E 01	1.42E 01	1.20E 01	9.75E 00	7.78E 00	6.22E 00	5.05E 00	4.17E 00	4.40E 00	2.70E 01	
17	0.05344	1.92E 01	1.85E 01	1.64E 01	1.37E 01	1.11E 01	8.85E 00	7.07E 00	5.74E 00	4.75E 00	5.11E 00	2.70E 01	
16	0.05078	2.23E 01	2.09E 01	1.83E 01	1.52E 01	1.23E 01	9.78E 00	7.81E 00	6.36E 00	5.28E 00	5.75E 00	2.70E 01	
15	0.04812	2.51E 01	2.30E 01	1.99E 01	1.64E 01	1.33E 01	1.05E 01	8.43E 00	6.88E 00	5.72E 00	6.28E 00	2.70E 01	
14	0.04562	2.74E 01	2.48E 01	2.12E 01	1.74E 01	1.40E 01	1.12E 01	8.93E 00	7.29E 00	6.08E 00	6.68E 00	2.70E 01	
13	0.04328	2.92E 01	2.61E 01	2.22E 01	1.82E 01	1.46E 01	1.16E 01	9.32E 00	7.62E 00	6.37E 00	6.98E 00	2.70E 01	
12	0.04094	3.08E 01	2.73E 01	2.31E 01	1.89E 01	1.52E 01	1.20E 01	9.65E 00	7.90E 00	6.61E 00	7.21E 00	2.70E 01	
11	0.03719	3.27E 01	2.87E 01	2.41E 01	1.97E 01	1.58E 01	1.25E 01	1.01E 01	8.25E 00	6.91E 00	7.47E 00	2.70E 01	
10	0.03437	3.36E 01	2.94E 01	2.47E 01	2.01E 01	1.61E 01	1.28E 01	1.03E 01	8.44E 00	7.08E 00	7.58E 00	2.70E 01	
9	0.03219	3.41E 01	2.97E 01	2.49E 01	2.03E 01	1.63E 01	1.30E 01	1.04E 01	8.55E 00	7.18E 00	7.61E 00	2.70E 01	
8	0.03031	3.43E 01	2.99E 01	2.50E 01	2.04E 01	1.64E 01	1.30E 01	1.05E 01	8.61E 00	7.23E 00	7.62E 00	2.70E 01	
7	0.02687	3.44E 01	2.99E 01	2.51E 01	2.04E 01	1.64E 01	1.31E 01	1.06E 01	8.68E 00	7.29E 00	7.56E 00	2.70E 01	
6	0.02187	3.39E 01	2.95E 01	2.48E 01	2.03E 01	1.63E 01	1.31E 01	1.06E 01	8.70E 00	7.31E 00	7.39E 00	2.70E 01	
5	0.01625	3.28E 01	2.87E 01	2.41E 01	1.98E 01	1.61E 01	1.29E 01	1.05E 01	8.63E 00	7.26E 00	7.16E 00	2.70E 01	
4	0.01062	3.16E 01	2.79E 01	2.35E 01	1.94E 01	1.58E 01	1.27E 01	1.03E 01	8.55E 00	7.20E 00	6.94E 00	2.70E 01	
3	0.00562	3.09E 01	2.73E 01	2.31E 01	1.91E 01	1.56E 01	1.26E 01	1.03E 01	8.51E 00	7.16E 00	6.82E 00	2.70E 01	
2	0.00156	3.07E 01	2.72E 01	2.30E 01	1.91E 01	1.56E 01	1.26E 01	1.03E 01	8.54E 00	7.19E 00	6.81E 00	2.70E 01	
1-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	2.75E 03	2.10E 03	1.60E 03	1.29E 03	1.08E 03	9.52E 02	1.03E 03	1.46E 03
19	0.05937	0.00	0.00	0.00	0.00	4.06E 03	3.71E 03	2.61E 03	1.84E 03	1.33E 03	1.03E 03	1.03E 03	1.38E 03
18	0.05594	0.00	0.00	0.00	0.00	6.14E 03	4.28E 03	2.91E 03	2.03E 03	1.46E 03	1.18E 03	1.33E 03	1.66E 03
17	0.05344	0.00	0.00	0.00	4.99E 03	4.68E 03	3.20E 03	2.28E 03	1.73E 03	1.39E 03	1.41E 03	1.73E 03	2.01E 03
16	0.05078	0.00	0.00	0.00	8.28E 03	4.83E 03	3.10E 03	2.13E 03	1.63E 03	1.52E 03	1.89E 03	2.30E 03	2.44E 03
15	0.04812	0.00	0.00	0.00	6.59E 03	4.40E 03	2.92E 03	2.03E 03	1.69E 03	2.01E 03	2.62E 03	2.93E 03	2.88E 03
14	0.04562	0.00	0.00	6.98E 03	6.20E 03	4.43E 03	3.04E 03	2.19E 03	2.15E 03	2.82E 03	3.38E 03	3.49E 03	3.25E 03
13	0.04328	0.00	0.00	1.11E 04	6.78E 03	4.80E 03	3.41E 03	2.68E 03	2.98E 03	3.70E 03	4.05E 03	3.95E 03	3.55E 03
12	0.04094	0.00	0.00	8.11E 03	6.68E 03	5.25E 03	3.99E 03	3.46E 03	3.98E 03	4.50E 03	4.59E 03	4.30E 03	3.78E 03
11	0.03719	0.00	7.91E 03	1.14E 04	7.80E 03	6.33E 03	5.20E 03	5.16E 03	5.52E 03	5.51E 03	5.20E 03	4.68E 03	4.01E 03
10	0.03437	0.00	2.38E 04	1.55E 04	9.30E 03	8.00E 03	7.14E 03	6.27E 03	6.10E 03	5.83E 03	5.39E 03	4.79E 03	4.07E 03
9	0.03219	0.00	2.60E 04	1.70E 04	1.05E 04	9.77E 03	8.06E 03	6.56E 03	6.19E 03	5.86E 03	5.39E 03	4.79E 03	4.06E 03
8	0.03031	4.49E 05	8.13E 04	2.02E 04	1.21E 04	1.16E 04	8.26E 03	6.45E 03	6.08E 03	5.77E 03	5.32E 03	4.73E 03	4.02E 03
7	0.02687	4.49E 05	8.10E 04	2.20E 04	1.47E 04	1.42E 04	7.44E 03	5.92E 03	5.69E 03	5.46E 03	5.09E 03	4.55E 03	3.88E 03

ITER	NO	I---	UMON	VMON	WMON	ABSOLUTE	RESIDUAL	SOURCE	SUMS	MASS	TKIN	DISP	U	V	W	P	D		
7	0.02687	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05		
6	0.02187	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05		
5	0.01625	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05		
4	0.01062	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05		
3	0.00562	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05		
2	0.00156	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05		
1	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
FIELD VALUES AT MONITORING LOCATION(22, 8) ---I																			
1	0.6787E	00	0.1181E-02	0.5000E-02	0.2642E	01	0.8179E	02	0.8238E	13	0.7521E	01	0.7749E-02	0.0000	-0.7551E	03	0.1457E	06	
2	0.1576E	01	0.1801E	01	0.5000E-02	0.3124E	01	0.1160E	02	0.2599E	13	0.7589E	01	0.2470E-01	0.0000	0.2324E	03	0.4591E	05
3	0.4946E	00	0.1098E	01	0.5000E-02	0.2938E	01	0.1955E	01	0.8020E	12	0.7641E	01	0.2002E-01	0.0000	0.4365E	03	0.1437E	05
4	0.6271E	00	0.7586E	00	0.5000E-02	0.6430E	01	0.3193E	00	0.2445E	12	0.7681E	01	0.1782E-01	0.0000	0.8011E	02	0.4567E	04
5	0.6817E	00	0.6851E	00	0.5000E-02	0.5212E	01	0.5459E-01	0.7195E	11	0.7720E	01	0.1843E-01	0.0000	0.1078E	03	0.1517E	04	
6	0.6710E	00	0.7365E	00	0.5000E-02	0.4380E	01	0.2346E-01	0.3958E	11	0.7765E	01	0.2416E-01	0.0000	0.1664E	03	0.5447E	03	
7	0.6368E	00	0.6548E	00	0.5000E-02	0.4840E	01	0.4553E-01	0.9424E	11	0.7821E	01	0.3176E-01	0.0000	0.1065E	03	0.2165E	03	
8	0.6962E	00	0.5374E	00	0.5000E-02	0.5425E	01	0.4709E-01	0.9336E	11	0.7895E	01	0.4516E-01	0.0000	0.1169E	03	0.9639E	02	
9	0.6922E	00	0.5629E	00	0.5000E-02	0.5965E	01	0.2722E-01	0.5048E	11	0.7990E	01	0.6081E-01	0.0000	0.1390E	03	0.5829E	02	
10	0.7249E	00	0.4238E	00	0.5000E-02	0.5816E	01	0.2336E-01	0.9570E	10	0.8114E	01	0.7937E-01	0.0000	0.1271E	03	0.3893E	02	
11	0.7290E	00	0.4058E	00	0.5000E-02	0.5851E	01	0.2378E-01	0.1612E	11	0.8272E	01	0.9966E-01	0.0000	0.1248E	03	0.3188E	02	
12	0.7453E	00	0.3284E	00	0.5000E-02	0.5480E	01	0.2254E-01	0.2046E	11	0.8469E	01	0.1195E	00	0.0000	0.1345E	03	0.2677E	02
13	0.7535E	00	0.3102E	00	0.5000E-02	0.4813E	01	0.2072E-01	0.1941E	11	0.8709E	01	0.1399E	00	0.0000	0.1333E	03	0.2418E	02
14	0.7479E	00	0.2389E	00	0.5000E-02	0.3660E	01	0.1811E-01	0.1493E	11	0.8988E	01	0.1570E	00	0.0000	0.1437E	03	0.2148E	02
15	0.7437E	00	0.2318E	00	0.5000E-02	0.2611E	01	0.1602E-01	0.1068E	11	0.9308E	01	0.1721E	00	0.0000	0.1459E	03	0.1918E	02
16	0.7365E	00	0.1866E	00	0.5000E-02	0.1655E	01	0.1495E-01	0.6581E	10	0.9664E	01	0.1841E	00	0.0000	0.1438E	03	0.1659E	02
17	0.7250E	00	0.1844E	00	0.5000E-02	0.1260E	01	0.1369E-01	0.2946E	10	0.1005E	02	0.1919E	00	0.0000	0.1427E	03	0.1396E	02
18	0.7236E	00	0.1627E	00	0.5000E-02	0.9442E	00	0.1381E-01	0.4492E	09	0.1047E	02	0.1960E	00	0.0000	0.1429E	03	0.1129E	02
19	0.7005E	00	0.1710E	00	0.5000E-02	0.7356E	00	0.1389E-01	0.2009E	10	0.1091E	02	0.1967E	00	0.0000	0.1408E	03	0.8881E	01
20	0.6961E	00	0.1499E	00	0.5000E-02	0.7537E	00	0.1390E-01	0.2366E	10	0.1136E	02	0.1940E	00	0.0000	0.1383E	03	0.7128E	01
21	0.6714E	00	0.1581E	00	0.5000E-02	0.6270E	00	0.1355E-01	0.2056E	10	0.1183E	02	0.1894E	00	0.0000	0.1386E	03	0.6852E	01
22	0.6606E	00	0.1409E	00	0.5000E-02	0.4631E	00	0.1344E-01	0.1484E	10	0.1230E	02	0.1831E	00	0.0000	0.1355E	03	0.8707E	01
23	0.6439E	00	0.1473E	00	0.5000E-02	0.4194E	00	0.1329E-01	0.7987E	09	0.1277E	02	0.1758E	00	0.0000	0.1325E	03	0.1126E	02
24	0.6332E	00	0.1295E	00	0.5000E-02	0.3250E	00	0.1354E-01	0.2177E	09	0.1325E	02	0.1691E	00	0.0000	0.1308E	03	0.1435E	02
25	0.6121E	00	0.1345E	00	0.5000E-02	0.3301E	00	0.1416E-01	0.5195E	09	0.1372E	02	0.1621E	00	0.0000	0.1279E	03	0.1765E	02
26	0.6023E	00	0.1156E	00	0.5000E-02	0.2666E	00	0.1469E-01	0.7614E	09	0.1419E	02	0.1574E	00	0.0000	0.1239E	03	0.2110E	02
27	0.5787E	00	0.1192E	00	0.5000E-02	0.2520E	00	0.1527E-01	0.8969E	09	0.1466E	02	0.1540E	00	0.0000	0.1204E	03	0.2465E	02
28	0.5682E	00	0.1022E	00	0.5000E-02	0.2470E	00	0.1598E-01	0.8871E	09	0.1513E	02	0.1527E	00	0.0000	0.1155E	03	0.2833E	02
29	0.5483E	00	0.1042E	00	0.5000E-02	0.2225E	00	0.1648E-01	0.8141E	09	0.1560E	02	0.1534E	00	0.0000	0.1101E	03	0.3225E	02
30	0.5349E	00	0.9086E-01	0.5000E-02	0.2181E	00	0.1740E-01	0.6968E	09	0.1607E	02	0.1564E	00	0.0000	0.1046E	03	0.3642E	02	
31	0.5206E	00	0.9214E-01	0.5000E-02	0.2059E	00	0.1834E-01	0.5370E	09	0.1654E	02	0.1615E	00	0.0000	0.9832E	02	0.4088E	02	
32	0.5053E	00	0.8251E-01	0.5000E-02	0.1965E	00	0.1946E-01	0.3829E	09	0.1702E	02	0.1685E	00	0.0000	0.9186E	02	0.4565E	02	
33	0.4970E	00	0.8262E-01	0.5000E-02	0.1899E	00	0.2067E-01	0.2335E	09	0.1750E	02	0.1769E	00	0.0000	0.8482E	02	0.5081E	02	
34	0.4848E	00	0.7495E-01	0.5000E-02	0.1832E	00	0.2202E-01	0.1767E	09	0.1800E	02	0.1871E	00	0.0000	0.7769E	02	0.5636E	02	
35	0.4796E	00	0.7543E-01	0.5000E-02	0.1743E	00	0.2354E-01	0.2376E	09	0.1850E	02	0.1981E	00	0.0000	0.7029E	02	0.6235E	02	
36	0.4731E	00	0.6942E-01	0.5000E-02	0.1639E	00	0.2513E-01	0.2687E	09	0.1902E	02	0.2099E	00	0.0000	0.6241E	02	0.6876E	02	
37	0.4673E	00	0.6959E-01	0.5000E-02	0.1532E	00	0.2686E-01	0.2731E	09	0.1955E	02	0.2221E	00	0.0000	0.5387E	02	0.7562E	02	
38	0.4632E	00	0.6546E-01	0.5000E-02	0.1428E	00	0.2857E-01	0.2476E	09	0.2009E	02	0.2345E	00	0.0000	0.4485E	02	0.8288E	02	
39	0.4571E	00	0.6639E-01	0.5000E-02	0.1319E	00	0.3046E-01	0.2168E	09	0.2063E	02	0.2459E	00	0.0000	0.3537E	02	0.9901E	02	
40	0.4528E	00	0.6260E-01	0.5000E-02	0.1219E	00	0.3240E-01	0.1799E	09	0.2117E	02	0.2568E	00	0.0000	0.2531E	02	0.1151E	03	
41	0.4459E	00	0.6435E-01	0.5000E-02	0.1121E	00	0.3444E-01	0.1396E	09	0.2170E	02	0.2660E	00	0.0000	0.1472E	02	0.1322E	03	
42	0.4392E	00	0.6141E-01	0.5000E-02	0.1033E	00	0.3656E-01	0.1119E	09	0.2221E	02	0.2728E	00	0.0000	0.3652E	01	0.1506E	03	
43	0.4297E	00	0.6357E-01	0.5000E-02	0.9426E-01	0.3875E-01	0.8820E	08	0.2269E	02	0.2759E	00	0.0000	-0.7829E	01	0.1697E	03		
44	0.4203E	00	0.6214E-01	0.5000E-02	0.8642E-01	0.4098E-01	0.7321E	08	0.2310E	02	0.2738E	00	0.0000	-0.1941E	02	0.1890E	03		

[illegible]

0 J	Y														
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	7.00E 01	9.60E 01	1.22E 02	1.45E 02	1.65E 02	1.80E 02	1.90E 02	1.96E 02	1.99E 02	2.01E 02	2.01E 02	2.01E 02	2.01E 02	0.00
19	0.05937	6.91E 01	9.50E 01	1.21E 02	1.44E 02	1.64E 02	1.79E 02	1.90E 02	1.96E 02	1.99E 02	2.01E 02	2.01E 02	2.01E 02	2.01E 02	0.00
18	0.05594	6.84E 01	9.41E 01	1.20E 02	1.43E 02	1.64E 02	1.79E 02	1.90E 02	1.96E 02	1.99E 02	2.01E 02	2.01E 02	2.01E 02	2.01E 02	0.00
17	0.05344	6.82E 01	9.39E 01	1.20E 02	1.43E 02	1.63E 02	1.79E 02	1.89E 02	1.96E 02	1.99E 02	2.01E 02	2.01E 02	2.01E 02	2.01E 02	0.00
16	0.05078	6.82E 01	9.38E 01	1.19E 02	1.43E 02	1.63E 02	1.78E 02	1.89E 02	1.95E 02	1.99E 02	2.01E 02	2.01E 02	2.01E 02	2.01E 02	0.00
15	0.04812	6.83E 01	9.38E 01	1.19E 02	1.43E 02	1.63E 02	1.78E 02	1.89E 02	1.95E 02	1.99E 02	2.01E 02	2.01E 02	2.01E 02	2.01E 02	0.00
14	0.04562	6.85E 01	9.40E 01	1.19E 02	1.43E 02	1.63E 02	1.78E 02	1.89E 02	1.95E 02	1.99E 02	2.00E 02	2.00E 02	2.00E 02	2.00E 02	0.00
13	0.04328	6.89E 01	9.43E 01	1.20E 02	1.43E 02	1.63E 02	1.78E 02	1.89E 02	1.95E 02	1.99E 02	2.00E 02	2.00E 02	2.00E 02	2.00E 02	0.00
12	0.04094	6.93E 01	9.46E 01	1.20E 02	1.43E 02	1.63E 02	1.78E 02	1.89E 02	1.95E 02	1.99E 02	2.00E 02	2.00E 02	2.00E 02	2.00E 02	0.00
11	0.03719	7.05E 01	9.55E 01	1.20E 02	1.43E 02	1.63E 02	1.78E 02	1.89E 02	1.95E 02	1.98E 02	2.00E 02	2.00E 02	2.00E 02	2.00E 02	0.00
10	0.03437	7.15E 01	9.62E 01	1.21E 02	1.44E 02	1.63E 02	1.78E 02	1.89E 02	1.95E 02	1.98E 02	1.99E 02	1.99E 02	1.99E 02	1.99E 02	0.00
9	0.03219	7.24E 01	9.69E 01	1.21E 02	1.44E 02	1.63E 02	1.78E 02	1.89E 02	1.95E 02	1.98E 02	1.99E 02	1.99E 02	1.99E 02	1.99E 02	0.00
8	0.03031	7.32E 01	9.75E 01	1.22E 02	1.44E 02	1.64E 02	1.79E 02	1.89E 02	1.95E 02	1.98E 02	1.99E 02	1.99E 02	1.99E 02	1.99E 02	0.00
7	0.02687	7.46E 01	9.86E 01	1.23E 02	1.45E 02	1.64E 02	1.79E 02	1.89E 02	1.95E 02	1.98E 02	1.99E 02	1.99E 02	1.99E 02	1.99E 02	0.00
6	0.02187	7.61E 01	1.00E 02	1.24E 02	1.46E 02	1.65E 02	1.79E 02	1.89E 02	1.95E 02	1.98E 02	1.98E 02	1.98E 02	1.98E 02	1.98E 02	0.00
5	0.01625	7.68E 01	1.01E 02	1.25E 02	1.47E 02	1.65E 02	1.80E 02	1.90E 02	1.95E 02	1.98E 02	1.97E 02	1.97E 02	1.97E 02	1.97E 02	0.00
4	0.01062	7.67E 01	1.01E 02	1.25E 02	1.47E 02	1.66E 02	1.80E 02	1.90E 02	1.96E 02	1.98E 02	1.97E 02	1.97E 02	1.97E 02	1.97E 02	0.00
3	0.00562	7.68E 01	1.01E 02	1.25E 02	1.47E 02	1.66E									

PRESSURE												
0	1	2	3	4	5	6	7	8	9	10	11	12
X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	-2.35E-04	-1.13E-04	8.10E-05	3.21E-04	4.62E-04	5.56E-04	7.25E-04
19	0.05937	0.00	0.00	0.00	0.00	-2.36E-04	-1.18E-04	7.35E-05	3.14E-04	4.53E-04	5.59E-04	7.29E-04

0	J	Y												
11	1.00000	0.00	2.50E-01	2.57E-01	2.60E-01	2.62E-01	2.64E-01	2.66E-01	2.68E-01	2.71E-01	2.75E-01	2.83E-01	2.93E-01	
10	0.90000	0.00	2.37E-01	2.39E-01	2.40E-01	2.41E-01	2.42E-01	2.43E-01	2.45E-01	2.48E-01	2.51E-01	2.57E-01	2.66E-01	
9	0.80000	0.00	2.23E-01	2.24E-01	2.25E-01	2.25E-01	2.26E-01	2.27E-01	2.28E-01	2.29E-01	2.32E-01	2.36E-01	2.42E-01	
8	0.70000	0.00	2.09E-01	2.09E-01	2.09E-01	2.10E-01	2.10E-01	2.10E-01	2.11E-01	2.12E-01	2.14E-01	2.17E-01	2.22E-01	
7	0.60000	0.00	1.93E-01	1.93E-01	1.93E-01	1.93E-01	1.94E-01	1.94E-01	1.94E-01	1.95E-01	1.97E-01	1.99E-01	2.03E-01	
6	0.50000	0.00	1.77E-01	1.77E-01	1.77E-01	1.77E-01	1.77E-01	1.77E-01	1.78E-01	1.78E-01	1.79E-01	1.81E-01	1.83E-01	
5	0.40000	0.00	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.58E-01	1.58E-01	1.59E-01	1.60E-01	1.62E-01	
4	0.30000	0.00	1.36E-01	1.36E-01	1.36E-01	1.36E-01	1.37E-01	1.37E-01	1.37E-01	1.37E-01	1.38E-01	1.38E-01	1.40E-01	
3	0.20000	0.00	1.10E-01	1.10E-01	1.10E-01	1.10E-01	1.10E-01	1.10E-01	1.10E-01	1.10E-01	1.11E-01	1.12E-01	1.13E-01	

SYMBOL	0	2	4	6	8	1
MAXIMUM VALUES	0.100E-29	0.191E 02	0.282E 02	0.359E 02	0.431E 02	0.500E 02

RADIAL POSITION 2R/D

[illegible]

7	0.02687	4.87E 00	5.05E 00	5.29E 00	5.54E 00	5.77E 00	5.95E 00	6.08E 00	6.14E 00	6.17E 00	6.16E 00	6.15E 00	
6	0.02187	3.27E 00	3.73E 00	4.21E 00	4.67E 00	5.07E 00	5.37E 00	5.59E 00	5.72E 00	5.78E 00	5.78E 00	5.77E 00	
5	0.01625	1.67E 00	2.42E 00	3.15E 00	3.82E 00	4.38E 00	4.81E 00	5.12E 00	5.31E 00	5.40E 00	5.42E 00	5.41E 00	
4	0.01062	4.31E-01	1.40E 00	2.33E 00	3.16E 00	3.85E 00	4.37E 00	4.76E 00	4.99E 00	5.12E 00	5.15E 00	5.14E 00	
3	0.00562	-2.68E-01	8.33E-01	1.87E 00	2.79E 00	3.55E 00	4.13E 00	4.56E 00	4.82E 00	4.96E 00	5.00E 00	4.99E 00	
2	0.00156	-5.21E-01	6.25E-01	1.70E 00	2.66E 00	3.44E 00	4.04E 00	4.48E 00	4.75E 00	4.90E 00	4.94E 00	4.93E 00	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	V VELOCITY												
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y											
21	0.06250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06062	0.00	0.00	0.00	0.00	3.90E-01	5.75E-01	2.51E-01	6.04E-02	-1.41E-02	-2.15E-02	-6.73E-03	1.76E-02
19	0.05766	0.00	0.00	0.00	0.00	1.53E 00	1.34E 00	6.32E-01	1.60E-01	-2.74E-02	-4.57E-02	-5.32E-03	5.26E-02
18	0.05469	0.00	0.00	0.00	0.00	3.20E 00	2.06E 00	9.75E-01	2.35E-01	-5.29E-02	-7.27E-02	3.14E-03	8.46E-02
17	0.05211	0.00	0.00	0.00	1.23E 00	3.91E 00	2.74E 00	1.25E 00	2.71E-01	-9.40E-02	-1.04E-01	8.39E-03	9.38E-02
16	0.04945	0.00	0.00	0.00	2.89E 00	4.80E 00	3.40E 00	1.50E 00	2.80E-01	-1.55E-01	-1.44E-01	-4.51E-03	7.01E-02
15	0.04687	0.00	0.00	0.00	4.95E 00	5.78E 00	4.00E 00	1.70E 00	2.58E-01	-2.30E-01	-1.97E-01	-5.33E-02	1.55E-02
14	0.04445	0.00	0.00	9.45E-01	6.47E 00	6.82E 00	4.52E 00	1.84E 00	2.06E-01	-3.16E-01	-2.77E-01	-1.32E-01	-5.23E-02
13	0.04211	0.00	0.00	2.75E 00	7.83E 00	7.72E 00	4.93E 00	1.91E 00	1.21E-01	-4.29E-01	-3.89E-01	-2.22E-01	-1.22E-01
12	0.03906	0.00	0.00	6.14E 00	9.60E 00	8.78E 00	5.32E 00	1.89E 00	-5.12E-02	-6.33E-01	-5.52E-01	-3.36E-01	-2.11E-01
11	0.03578	0.00	1.26E 00	1.00E 01	1.16E 01	9.67E 00	5.48E 00	1.65E 00	-4.29E-01	-9.01E-01	-6.87E-01	-4.25E-01	-2.88E-01
10	0.03328	0.00	5.48E 00	1.18E 01	1.26E 01	9.99E 00	5.33E 00	1.22E 00	-7.54E-01	-1.03E 00	-7.44E-01	-4.73E-01	-3.36E-01
9	0.03125	0.00	1.08E 01	1.27E 01	1.31E 01	9.98E 00	5.01E 00	7.62E-01	-9.73E-01	-1.09E 00	-7.67E-01	-5.01E-01	-3.67E-01
8	0.02859	0.00	9.68E 00	1.30E 01	1.32E 01	9.74E 00	4.38E 00	1.43E-01	-1.18E 00	-1.11E 00	-7.74E-01	-5.28E-01	-4.01E-01
7	0.02437	0.00	8.74E 00	1.31E 01	1.31E 01	8.93E 00	2.67E 00	-8.66E-01	-1.24E 00	-1.02E 00	-7.39E-01	-5.42E-01	-4.30E-01
6	0.01906	0.00	8.44E 00	1.30E 01	1.22E 01	6.80E 00	-8.16E-01	-1.08E 00	-9.95E-01	-8.21E-01	-6.44		

[illegible]


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1X-AXIS IS XI
Y-AXES ARE          00          02          04          06          08          10
SYMBOL              0          2          4          6          8          1
MAXIMUM VALUES  0.260E 00  0.320E 00  0.366E 00  0.409E 00  0.455E 00  0.500E 00

```

	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
X 0.00	0	0	0	0	0	0	0	0	0	0	0
X 0.02	0	2	4	6	8	1	0	0	0	0	0
X 0.04	.	0	2	4	6	8	1	0	0	0	0
X 0.06	.	0	0	2	4	6	8	1	0	0	0
X 0.08	.	.	0	2	4	6	8	1	0	0	0

155	0.2962E-01	0.9379E-02	0.2206E-01	0.3930E-02	0.4058E-02	0.1092E	08	0.6282E	01	0.4274E-02	0.1063E	02	0.1156E	04	0.9807E	03
156	0.2855E-01	0.9137E-02	0.2204E-01	0.3926E-02	0.3990E-02	0.1039E	08	0.6290E	01	0.4086E-02	0.1064E	02	0.1156E	04	0.9800E	03
157	0.2751E-01	0.8920E-02	0.2200E-01	0.3868E-02	0.3920E-02	0.9944E	07	0.6298E	01	0.3902E-02	0.1064E	02	0.1156E	04	0.9793E	03
158	0.2657E-01	0.8726E-02	0.2195E-01	0.3868E-02	0.3818E-02	0.8789E	07	0.6306E	01	0.3731E-02	0.1065E	02	0.1157E	04	0.9788E	03
159	0.2551E-01	0.8549E-02	0.2191E-01	0.3918E-02	0.3808E-02	0.1100E	08	0.6313E	01	0.3543E-02	0.1066E	02	0.1157E	04	0.9783E	03
160	0.2449E-01	0.8356E-02	0.2186E-01	0.3827E-02	0.3804E-02	0.1182E	08	0.6320E	01	0.3351E-02	0.1067E	02	0.1157E	04	0.9773E	03
161	0.2366E-01	0.8182E-02	0.2177E-01	0.3793E-02	0.3680E-02	0.7937E	07	0.6327E	01	0.3183E-02	0.1067E	02	0.1157E	04	0.9766E	03
162	0.2287E-01	0.8027E-02	0.2167E-01	0.3824E-02	0.3561E-02	0.6325E	07	0.6333E	01	0.3032E-02	0.1068E	02	0.1157E	04	0.9761E	03
163	0.2199E-01	0.7889E-02	0.2159E-01	0.3863E-02	0.3531E-02	0.7883E	07	0.6340E	01	0.2866E-02	0.1069E	02	0.1157E	04	0.9755E	03
164	0.2117E-01	0.7743E-02	0.2151E-01	0.3826E-02	0.3514E-02	0.8728E	07	0.6346E	01	0.2696E-02	0.1070E	02	0.1158E	04	0.9750E	03
165	0.2037E-01	0.7634E-02	0.2141E-01	0.3745E-02	0.3488E-02	0.8828E	07	0.6351E	01	0.2527E-02	0.1071E	02	0.1158E	04	0.9743E	03
166	0.1961E-01	0.7563E-02	0.2131E-01	0.3723E-02	0.3452E-02	0.8442E	07	0.6357E	01	0.2361E-02	0.1071E	02	0.1158E	04	0.9736E	03
167	0.1890E-01	0.7511E-02	0.2119E-01	0.3722E-02	0.3409E-02	0.7937E	07	0.6362E	01	0.2203E-02	0.1072E	02	0.1158E	04	0.9729E	03
168	0.1823E-01	0.7487E-02	0.2107E-01	0.3706E-02	0.3357E-02	0.7281E	07	0.6367E	01	0.2050E-02	0.1073E	02	0.1158E	04	0.9722E	03
169	0.1760E-01	0.7467E-02	0.2093E-01	0.3694E-02	0.3301E-02	0.6526E	07	0.6372E	01	0.1905E-02	0.1074E	02	0.1159E	04	0.9715E	03
170	0.1701E-01	0.7442E-02	0.2079E-01	0.3691E-02	0.3240E-02	0.6002E	07	0.6377E	01	0.1768E-02	0.1075E	02	0.1159E	04	0.9708E	03
171	0.1646E-01	0.7427E-02	0.2064E-01	0.3670E-02	0.3176E-02	0.5771E	07	0.6381E	01	0.1638E-02	0.1076E	02	0.1159E	04	0.9700E	03
172	0.1594E-01	0.7418E-02	0.2049E-01	0.3653E-02	0.3109E-02	0.5424E	07	0.6385E	01	0.1517E-02	0.1077E	02	0.1159E	04	0.9693E	03
173	0.1546E-01	0.7414E-02	0.2033E-01	0.3670E-02	0.3041E-02	0.5443E	07	0.6389E	01	0.1403E-02	0.1077E	02	0.1159E	04	0.9686E	03
174	0.1502E-01	0.7425E-02	0.2016E-01	0.3665E-02	0.2971E-02	0.5377E	07	0.6393E	01	0.1297E-02	0.1078E	02	0.1160E	04	0.9680E	03
175	0.1460E-01	0.7435E-02	0.2000E-01	0.3685E-02	0.2902E-02	0.5478E	07	0.6396E	01	0.1198E-02	0.1079E	02	0.1160E	04	0.9673E	03
176	0.1422E-01	0.7443E-02	0.1983E-01	0.3647E-02	0.2832E-02	0.5539E	07	0.6400E	01	0.1108E-02	0.1080E	02	0.1160E	04	0.9667E	03
177	0.1386E-01	0.7454E-02	0.1965E-01	0.3678E-02	0.2762E-02	0.5609E	07	0.6403E	01	0.1024E-02	0.1081E	02	0.1160E	04	0.9661E	03
178	0.1352E-01	0.7445E-02	0.1948E-01	0.3643E-02	0.2691E-02	0.5767E	07	0.6406E	01	0.9487E-03	0.1082E	02	0.1160E	04	0.9655E	03
179	0.1321E-01	0.7444E-02	0.1930E-01	0.3639E-02	0.2622E-02	0.5865E	07	0.6409E	01	0.8795E-03	0.1083E	02	0.1161E	04	0.9650E	03
180	0.1293E-01	0.7423E-02	0.1912E-01	0.3635E-02	0.2552E-02	0.6029E	07	0.6412E	01	0.8176E-03	0.1084E	02	0.1161E	04	0.9645E	03
181	0.1266E-01	0.7412E-02	0.1894E-01	0.3666E-02	0.2483E-02	0.6238E	07	0.6415E	01	0.7621E-03	0.1085E	02	0.1161E	04	0.9640E	03
182	0.1243E-01	0.7378E-02	0.1876E-01	0.3662E-02	0.2415E-02	0.6536E	07	0.6417E	01	0.7125E-03	0.1086E	02	0.1161E	04	0.9635E	03
183	0.1221E-01	0.7349E-02	0.1857E-01	0.3642E-02	0.2348E-02	0.6882E	07	0.6420E	01	0.6691E-03	0.1087E	02	0.1161E	04	0.9631E	03
184	0.1200E-01	0.7317E-02	0.1839E-01	0.3632E-02	0.2281E-02	0.7141E	07	0.6422E	01	0.6316E-03	0.1087E	02	0.1162E	04	0.9627E	03
185	0.1182E-01	0.7271E-02	0.1820E-01	0.3681E-02	0.2215E-02	0.7299E	07	0.6425E	01	0.5990E-03	0.1088E	02	0.1162E	04	0.9623E	03
186	0.1164E-01	0.7223E-02	0.1801E-01	0.3645E-02	0.2150E-02	0.7646E	07	0.6427E	01	0.5717E-03	0.1089E	02	0.1162E	04	0.9619E	03
187	0.1149E-01	0.7167E-02	0.1782E-01	0.3612E-02	0.2086E-02	0.8058E	07	0.6429E	01	0.5486E-03	0.1090E	02	0.1162E	04	0.9616E	03
188	0.1135E-01	0.7105E-02	0.1763E-01	0.3647E-02	0.2023E-02	0.8349E	07	0.6431E	01	0.5306E-03	0.1091E	02	0.1163E	04	0.9613E	03
189	0.1122E-01	0.7045E-02	0.1744E-01	0.3608E-02	0.1961E-02	0.8645E	07	0.6433E	01	0.5157E-03	0.1092E	02	0.1163E	04	0.9610E	03
190	0.1110E-01	0.6974E-02	0.1725E-01	0.3564E-02	0.1901E-02	0.8927E	07	0.6435E	01	0.5049E-03	0.1093E	02	0.1163E	04	0.9608E	03
191	0.1098E-01	0.6911E-02	0.1706E-01	0.3618E-02	0.1842E-02	0.9175E	07	0.6437E	01	0.4970E-03	0.1094E	02	0.1163E	04	0.9606E	03
192	0.1088E-01	0.6834E-02	0.1687E-01	0.3573E-02	0.1785E-02	0.9645E	07	0.6439E	01	0.4921E-03	0.1095E	02	0.1163E	04	0.9604E	03
193	0.1078E-01	0.6758E-02	0.1669E-01	0.3592E-02	0.1729E-02	0.9855E	07	0.6440E	01	0.4898E-03	0.1096E	02	0.1164E	04	0.9602E	03
194	0.1069E-01	0.6681E-02	0.1650E-01	0.3597E-02	0.1675E-02	0.1028E	08	0.6442E	01	0.4909E-03	0.1097E	02	0.1164E	04	0.9600E	03
195	0.1060E-01	0.6601E-02	0.1632E-01	0.3551E-02	0.1622E-02	0.1043E	08	0.6444E	01	0.4928E-03	0.1097E	02	0.1164E	04	0.9598E	03
196	0.1058E-01	0.6522E-02	0.1611E-01	0.3543E-02	0.1499E-02	0.6884E	07	0.6446E	01	0.5256E-03	0.1098E	02	0.1164E	04	0.9597E	03
197	0.1054E-01	0.6416E-02	0.1592E-01	0.3603E-02	0.1392E-02	0.6376E	07	0.6447E	01	0.5655E-03	0.1099E	02	0.1165E	04	0.9597E	03
198	0.1048E-01	0.6285E-02	0.1574E-01	0.3609E-02	0.1348E-02	0.9024E	07	0.6449E	01	0.5888E-03	0.1100E	02	0.1165E	04	0.9597E	03
199	0.1042E-01	0.6171E-02	0.1556E-01	0.3647E-02	0.1317E-02	0.1103E	08	0.6451E	01	0.6012E-03	0.1101E	02	0.1165E	04	0.9597E	03
200	0.1035E-01	0.6065E-02	0.1540E-01	0.3642E-02	0.1287E-02	0.1224E	08	0.6453E	01	0.6083E-03	0.1102E	02	0.1165E	04	0.9597E	03

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SWIRL CASE WITH LFS = 3
AND NSBR = 0

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 1.000

	13	14	15	16	17	18	19	20	21	22	23
$I =$											
$X =$	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

DIMENSIONLESS STREAM FUNCTION

[illegible]

45	0.4090E	00	0.6431E-01	0.5000E-02	0.8085E-01	0.4330E-01	0.7444E	08	0.2342E	02	0.2648E	00	0.0000-0.3070E	02	0.2075E	03
46	0.4005E	00	0.6418E-01	0.5000E-02	0.7514E-01	0.4566E-01	0.7323E	08	0.2359E	02	0.2469E	00	0.0000-0.4102E	02	0.2243E	03
47	0.3946E	00	0.6550E-01	0.5000E-02	0.7198E-01	0.4808E-01	0.7439E	08	0.2361E	02	0.2185E	00	0.0000-0.4973E	02	0.2383E	03
48	0.3887E	00	0.6530E-01	0.5000E-02	0.6847E-01	0.5050E-01	0.7821E	08	0.2352E	02	0.1767E	00	0.0000-0.5591E	02	0.2487E	03
49	0.3865E	00	0.6476E-01	0.5000E-02	0.6686E-01	0.5289E-01	0.7660E	08	0.2336E	02	0.1245E	00	0.0000-0.5910E	02	0.2547E	03
50	0.3880E	00	0.6367E-01	0.5000E-02	0.6508E-01	0.5528E-01	0.8164E	08	0.2313E	02	0.6845E-01	0.0000-0.5873E	02	0.2561E	03	
51	0.3932E	00	0.6127E-01	0.5000E-02	0.6294E-01	0.5763E-01	0.8368E	08	0.2284E	02	0.1274E-01	0.0000-0.5485E	02	0.2532E	03	
52	0.4003E	00	0.5931E-01	0.5000E-02	0.6117E-01	0.5999E-01	0.9366E	08	0.2251E	02-0.3884E-01	0.0000-0.4762E	02	0.2467E	03		
53	0.4060E	00	0.5553E-01	0.5000E-02	0.5703E-01	0.6230E-01	0.1137E	09	0.2214E	02-0.8367E-01	0.0000-0.3770E	02	0.2375E	03		
54	0.4125E	00	0.5382E-01	0.5000E-02	0.5338E-01	0.6454E-01	0.1368E	09	0.2175E	02-0.1205E	00	0.0000-0.2581E	02	0.2267E	03	
55	0.4172E	00	0.5011E-01	0.5000E-02	0.4725E-01	0.6671E-01	0.1656E	09	0.2134E	02-0.1488E	00	0.0000-0.1286E	02	0.2155E	03	
56	0.4203E	00	0.4920E-01	0.5000E-02	0.4330E-01	0.6878E-01	0.1866E	09	0.2093E	02-0.1690E	00	0.0000	0.4313E	00	0.2047E	03
57	0.4217E	00	0.4644E-01	0.5000E-02	0.3836E-01	0.7074E-01	0.2043E	09	0.2052E	02-0.1820E	00	0.0000	0.1333E	02	0.1950E	03
58	0.4219E	00	0.4665E-01	0.5000E-02	0.3578E-01	0.7252E-01	0.2156E	09	0.2011E	02-0.1889E	00	0.0000	0.2543E	02	0.1870E	03
59	0.4215E	00	0.4524E-01	0.5000E-02	0.2972E-01	0.7410E-01	0.2213E	09	0.1971E	02-0.1912E	00	0.0000	0.3641E	02	0.1808E	03
60	0.4213E	00	0.4732E-01	0.5000E-02	0.2750E-01	0.7555E-01	0.2176E	09	0.1932E	02-0.1901E	00	0.0000	0.4627E	02	0.1766E	03
61	0.4215E	00	0.4625E-01	0.5000E-02	0.2318E-01	0.7689E-01	0.2126E	09	0.1894E	02-0.1868E	00	0.0000	0.5509E	02	0.1744E	03
62	0.4219E	00	0.4792E-01	0.5000E-02	0.2248E-01	0.7810E-01	0.2124E	09	0.1857E	02-0.1821E	00	0.0000	0.6310E	02	0.1739E	03
63	0.4229E	00	0.4641E-01	0.5000E-02	0.1945E-01	0.7917E-01	0.2245E	09	0.1823E	02-0.1765E	00	0.0000	0.7052E	02	0.1750E	03
64	0.4247E	00	0.4744E-01	0.5000E-02	0.1972E-01	0.8008E-01	0.2325E	09	0.1789E	02-0.1703E	00	0.0000	0.7762E	02	0.1775E	03
65	0.4265E	00	0.4570E-01	0.5000E-02	0.1804E-01	0.8082E-01	0.2363E	09	0.1757E	02-0.1638E	00	0.0000	0.8452E	02	0.1815E	03
66	0.4285E	00	0.4653E-01	0.5000E-02	0.1842E-01	0.8135E-01	0.2355E	09	0.1727E	02-0.1571E	00	0.0000	0.9133E	02	0.1867E	03
67	0.4305E	00	0.4492E-01	0.5000E-02	0.1714E-01	0.8167E-01	0.2350E	09	0.1698E	02-0.1506E	00	0.0000	0.9798E	02	0.1932E	03
68	0.4326E	00	0.4554E-01	0.5000E-02	0.1716E-01	0.8175E-01	0.2361E	09	0.1670E	02-0.1442E	00	0.0000	0.1044E	03	0.2010E	03
69	0.4345E	00	0.4405E-01	0.5000E-02	0.1574E-01	0.8159E-01	0.2440E	09	0.1643E	02-0.1381E	00	0.0000	0.1106E	03	0.2101E	03
70	0.4363E	00	0.4461E-01	0.5000E-02	0.1537E-01	0.8117E-01	0.2499E	09	0.1618E	02-0.1324E	00	0.0000	0.1162E	03	0.2205E	03
71	0.4378E	00	0.4325E-01	0.5000E-02	0.1374E-01	0.8048E-01	0.2524E	09	0.1594E	02-0.1270E	00	0.0000	0.1213E	03	0.2324E	03
72	0.4392E	00	0.4376E-01	0.5000E-02	0.1329E-01	0.7954E-01	0.2515E	09	0.1571E	02-0.1220E	00	0.0000	0.1259E	03	0.2458E	03
73	0.4402E	00	0.4253E-01	0.5000E-02	0.1179E-01	0.7834E-01	0.2468E	09	0.1549E	02-0.1173E	00	0.0000	0.1299E	03	0.2607E	03
74	0.4408E	00	0.4300E-01	0.5000E-02	0.1150E-01	0.7690E-01	0.2390E	09	0.1528E	02-0.1128E	00	0.0000	0.1333E	03	0.2771E	03
75	0.4410E	00	0.4185E-01	0.5000E-02	0.1031E-01	0.7524E-01	0.2298E	09	0.1508E	02-0.1087E	00	0.0000	0.1364E	03	0.2950E	03
76	0.4409E	00	0.4225E-01	0.5000E-02	0.1033E-01	0.7337E-01	0.2194E	09	0.1489E	02-0.1049E	00	0.0000	0.1393E	03	0.3143E	03
77	0.4403E	00	0.4117E-01	0.5000E-02	0.9532E-02	0.7133E-01	0.2130E	09	0.1470E	02-0.1012E	00	0.0000	0.1420E	03	0.3348E	03
78	0.4396E	00	0.4153E-01	0.5000E-02	0.9790E-02	0.6912E-01	0.2087E	09	0.1452E	02-0.9783E-01	0.0000-0.1446E	03	0.3566E	03		
79	0.4384E	00	0.4052E-01	0.5000E-02	0.9238E-02	0.6678E-01	0.2037E	09	0.1435E	02-0.9463E-01	0.0000-0.1473E	03	0.3793E	03		
80	0.4370E	00	0.4084E-01	0.5000E-02	0.9481E-02	0.6432E-01	0.1965E	09	0.1419E	02-0.9162E-01	0.0000-0.1500E	03	0.4028E	03		
81	0.4351E	00	0.3992E-01	0.5000E-02	0.8928E-02	0.6175E-01	0.1889E	09	0.1403E	02-0.8877E-01	0.0000-0.1527E	03	0.4269E	03		
82	0.4330E	00	0.4021E-01	0.5000E-02	0.9011E-02	0.5911E-01	0.1813E	09	0.1387E	02-0.8608E-01	0.0000-0.1553E	03	0.4515E	03		
83	0.4305E	00	0.3934E-01	0.5000E-02	0.8381E-02	0.5641E-01	0.1775E	09	0.1373E	02-0.8352E-01	0.0000-0.1578E	03	0.4762E	03		
84	0.4278E	00	0.3958E-01	0.5000E-02	0.8297E-02	0.5365E-01	0.1740E	09	0.1358E	02-0.8107E-01	0.0000-0.1600E	03	0.5010E	03		
85	0.4248E	00	0.3874E-01	0.5000E-02	0.7624E-02	0.5087E-01	0.1694E	09	0.1344E	02-0.7875E-01	0.0000-0.1621E	03	0.5256E	03		
86	0.4215E	00	0.3888E-01	0.5000E-02	0.7520E-02	0.4806E-01	0.1631E	09	0.1331E	02-0.7653E-01	0.0000-0.1639E	03	0.5498E	03		
87	0.4178E	00	0.3806E-01	0.5000E-02	0.6901E-02	0.4525E-01	0.1561E	09	0.1318E	02-0.7442E-01	0.0000-0.1655E	03	0.5736E	03		
88	0.4140E	00	0.3816E-01	0.5000E-02	0.6857E-02	0.4248E-01	0.1488E	09	0.1305E	02-0.7241E-01	0.0000-0.1670E	03	0.5966E	03		
89	0.4098E	00	0.3735E-01	0.5000E-02	0.6363E-02	0.3978E-01	0.1404E	09	0.1293E	02-0.7049E-01	0.0000-0.1683E	03	0.6190E	03		
90	0.4054E	00	0.3740E-01	0.5000E-02	0.6419E-02	0.3718E-01	0.1326E	09	0.1281E	02-0.6864E-01	0.0000-0.1697E	03	0.6404E	03		
91	0.4008E	00	0.3661E-01	0.5000E-02	0.6039E-02	0.3475E-01	0.1273E	09	0.1270E	02-0.6686E-01	0.0000-0.1710E	03	0.6610E	03		
92	0.3959E	00	0.3662E-01	0.5000E-02	0.6118E-02	0.3243E-01	0.1217E	09	0.1259E	02-0.6514E-01	0.0000-0.1723E	03	0.6806E	03		
93	0.3908E	00	0.3585E-01	0.5000E-02	0.5802E-02	0.3022E-01	0.1162E	09	0.1248E	02-0.6349E-01	0.0000-0.1737E	03	0.6992E	03		
94	0.3856E	00	0.3583E-01	0.5000E-02	0.5838E-02	0.2825E-01	0.1103E	09	0.1237E	02-0.6189E-01	0.0000-0.1750E	03	0.7167E	03		
95	0.3801E	00	0.3507E-01	0.5000E-02	0.5516E-02	0.2647E-01	0.1049E	09	0.1227E	02-0.6034E-01	0.0000-0.1764E	03	0.7332E	03		
96	0.3744E	00	0.3501E-01	0.5000E-02	0.5503E-02	0.2487E-01	0.1010E	09	0.1217E	02-0.5884E-01	0.0000-0.1776E	03	0.7486E	03		
97	0.3686E	00	0.3427E-01	0.5000E-02	0.5147E-02	0.2343E-01	0.9682E	08	0.1207E	02-0.5738E-01	0.0000-0.1788E	03	0.7630E	03		
98	0.3627E	00	0.3418E-01	0.5000E-02	0.5104E-02	0.2231E-01	0.9261E	08	0.1197E	02-0.5597E-01	0.0000-0.1799E	03	0.7763E	03		

18	0.05594	0.00	0.00	0.00	0.00-2.38E-04-1.24E-04	5.63E-05	3.01E-04	4.32E-04	5.62E-04	7.57E-04	1.03E-03		
17	0.05344	0.00	0.00	0.00-2.85E-04-2.40E-04-1.27E-04	3.67E-05	2.79E-04	3.98E-04	5.55E-04	7.94E-04	1.01E-03			
16	0.05078	0.00	0.00	0.00-3.05E-04-2.41E-04-1.21E-04	2.25E-05	2.50E-04	3.53E-04	5.27E-04	8.35E-04	1.02E-03			
15	0.04812	0.00	0.00	0.00-3.36E-04-2.38E-04-1.05E-04	1.98E-05	2.19E-04	3.07E-04	4.89E-04	8.55E-04	1.06E-03			
14	0.04562	0.00	0.00-3.86E-04-3.62E-04-2.38E-04-8.48E-05	3.75E-05	1.99E-04	2.59E-04	4.35E-04	8.56E-04	1.06E-03				
13	0.04328	0.00	0.00-4.09E-04-3.81E-04-2.36E-04-6.62E-05	7.91E-05	2.00E-04	2.15E-04	3.68E-04	8.38E-04	1.05E-03				
12	0.04094	0.00	0.00-4.44E-04-3.80E-04-2.21E-04-3.69E-05	1.45E-04	2.30E-04	2.05E-04	3.26E-04	8.10E-04	1.03E-03				
11	0.03719	0.00-3.49E-04-4.36E-04-3.61E-04-1.75E-04	2.75E-05	2.66E-04	3.27E-04	2.47E-04	2.94E-04	7.68E-04	1.03E-03				
10	0.03437	0.00-3.19E-04-3.79E-04-2.66E-04-5.20E-06	1.76E-04	4.74E-04	5.08E-04	3.68E-04	2.56E-04	7.24E-04	1.07E-03				
9	0.03219	0.00	4.02E-05-1.00E-04-5.80E-05	2.71E-04	4.16E-04	7.35E-04	7.80E-04	5.66E-04	2.03E-04	6.71E-04	1.09E-03		
8	0.03031	0.00	3.40E-04	3.22E-04	1.75E-04	5.53E-04	6.26E-04	9.64E-04	1.06E-03	7.47E-04	2.48E-04	6.48E-04	1.12E-03
7	0.02687	0.00	3.34E-04	5.69E-04	2.19E-04	7.72E-04	7.77E-04	1.13E-03	1.34E-03	9.78E-04	4.02E-04	6.63E-04	1.21E-03
6	0.02187	0.00	2.22E-04	5.31E-04	6.16E-05	4.25E-04	6.36E-04	1.16E-03	1.33E-03	1.05E-03	4.10E-04	6.33E-04	1.34E-03
5	0.01625	0.00-1.28E-04-9.97E-05-4.88E-04-1.13E-05	3.64E-04	8.80E-04	1.07E-03	9.32E-04	3.51E-04	5.81E-04	1.40E-03				
4	0.01062	0.00-4.71E-04-7.63E-04-5.43E-04-2.40E-04	1.34E-04	6.12E-04	8.67E-04	9.14E-04	2.69E-04	6.06E-04	1.41E-03				
3	0.00562	0.00-5.49E-04-8.77E-04-6.38E-04-5.78E-04-8.26E-05	4.97E-04	7.55E-04	8.35E-04	2.30E-04	5.77E-04	1.42E-03					
2	0.00156	0.00-5.51E-04-8.71E-04-7.34E-04-7.05E-04-1.18E-04	4.58E-04	6.70E-04	8.58E-04	2.42E-04	5.89E-04	1.39E-03					
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127	
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	1.71E-03	2.32E-03	2.14E-03	2.23E-03	2.09E-03	1.16E-03	4.59E-04-7.62E-04-1.53E-03-4.86E-03				0.00	
19	0.05937	1.66E-03	2.27E-03	2.10E-03	2.26E-03	2.15E-03	1.20E-03	5.00E-04-7.59E-04-1.64E-03-4.91E-03				0.00	
18	0.05594	1.61E-03	2.26E-03	2.06E-03	2.21E-03	2.18E-03	1.19E-03	5.11E-04-8.07E-04-1.82E-03-4.94E-03				0.00	
17	0.05344	1.59E-03	2.31E-03	2.00E-03	2.12E-03	2.13E-03	1.09E-03	4.18E-04-1.00E-03-2.07E-03-4.89E-03				0.00	
16	0.05078	1.59E-03	2.40E-03	1.96E-03	1.99E-03	2.00E-03	8.81E-04	2.50E-04-1.30E-03-2.40E-03-4.79E-03				0.00	
15	0.04812	1.61E-03											

DIMENSIONLESS PRESSURE													
0	1	2	3	4	5	6	7	8	9	10	11	12	
X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415	
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.49500	0.00	0.00	0.00	0.00	3.31E 03	1.80E 03	1.16E 03	1.40E 03	2.78E 03	5.64E 03	1.04E 04	1.73E 04
19	0.47500	0.00	0.00	0.00	0.00	3.39E 03	2.00E 03	1.31E 03	1.52E 03	2.84E 03	5.63E 03	1.03E 04	1.71E 04
18	0.44750	0.00	0.00	0.00	0.00	3.00E 03	1.91E 03	1.32E 03	1.54E 03	2.85E 03	5.60E 03	1.02E 04	1.69E 04
17	0.42750	0.00	0.00	0.00	1.87E 03	2.30E 03	1.77E 03	1.27E 03	1.51E 03	2.83E 03	5.59E 03	1.02E 04	1.69E 04
16	0.40625	0.00	0.00	0.00	2.26E 03	2.13E 03	1.62E 03	1.20E 03	1.48E 03	2.82E 03	5.58E 03	1.02E 04	1.69E 04
15	0.38500	0.00	0.00	0.00	2.09E 03	1.99E 03	1.51E 03	1.14E 03	1.46E 03	2.83E 03	5.61E 03	1.02E 04	1.69E 04
14	0.36500	0.00	0.00	5.43E 02	1.52E 03	1.92E 03	1.46E 03	1.13E 03	1.49E 03	2.88E 03	5.68E 03	1.03E 04	1.70E 04
13	0.34625	0.00	0.00	9.87E 02	1.56E 03	1.96E 03	1.49E 03	1.19E 03	1.57E 03	2.97E 03	5.79E 03	1.04E 04	1.71E 04
12	0.32750	0.00	0.00	6.27E 02	1.54E 03	2.06E 03	1.60E 03	1.31E 03	1.70E 03	3.12E 03	5.96E 03	1.06E 04	1.73E 04
11	0.29750	0.00	-8.62E 03	-8.57E 02	1.62E 03	2.33E 03	1.88E 03	1.62E 03	2.04E 03	3.49E 03	6.38E 03	1.11E 04	1.78E 04
10	0.27500	0.00	-8.38E 03	-7.20E 02	1.98E 03	2.52E 03	2.11E 03	1.91E 03	2.37E 03	3.86E 03	6.81E 03	1.16E 04	1.83E 04
9	0.25750	0.00	-1.41E 04	1.06E 03	2.12E 03	2.61E 03	2.32E 03	2.17E 03	2.66E 03	4.20E 03	7.21E 03	1.20E 04	1.87E 04
8	0.24250	0.00	-3.88E 03	6.17E 02	2.16E 03	2.84E 03	2.62E 03	2.45E 03	2.91E 03	4.50E 03	7.59E 03	1.24E 04	1.90E 04
7	0.21500	0.00	-2.57E 03	3.54E 02	2.00E 03	2.78E 03	2.80E 03	2.85E 03	3.56E 03	5.31E 03	8.38E 03	1.31E 04	1.96E 04
6	0.17500	0.00	-1.41E 03	2.80E 02	1.67E 03	2.50E 03	2.78E 03	3.04E 03	3.86E 03	5.65E 03	8.78E 03	1.37E 04	2.03E 04
5	0.13000	0.00	-6.66E 02	3.63E 02	1.48E 03	2.30E 03	2.75E 03	3.17E 03	4.08E 03	5.90E 03	9.04E 03	1.39E 04	2.04E 04
4	0.08500	0.00	-2.57E 02	4.64E 02	1.39E 03	2.19E 03	2.73E 03	3.26E 03	4.23E 03	6.07E 03	9.21E 03	1.40E 04	2.05E 04
3	0.04500	0.00	-6.49E 01	5.26E 02	1.36E 03	2.13E 03	2.72E 03	3.31E 03	4.31E 03	6.16E 03	9.31E 03	1.41E 04	2.05E 04
2	0.01250	0.00	0.00	5.49E 02	1.35E 03	2.12E 03	2.72E 03	3.32E 03	4.33E 03	6.20E 03	9.34E 03	1.41E 04	2.05E 04
1													

X 0.46	0	2	4	6	8	1	0.46
X 0.48	.						0.48
X 0.50	+						+ 0.50
X 0.52	0	2	4	6	8	1	0.52
X 0.54	.						0.54
X 0.56	.						0.56
X 0.58	0	2	4	6	8	1	0.58
X 0.60	+						+ 0.60
X 0.62	.						0.62
X 0.64	.						0.64
X 0.66	0	2	4	6	8	1	0.66
X 0.68	.						0.68
X 0.70	+						+ 0.70
X 0.72	.						0.72
X 0.74	0	2	4	6	8	1	0.74
X 0.76	.						0.76
X 0.78	.						0.78
X 0.80	+						+ 0.80
X 0.82	.						0.82
X 0.84	0	2	4	6	8	1	0.84
X 0.86	.						0.86
X 0.88	.						0.88
X 0.90	+						+ 0.90
X 0.92	0	2	4	6	8	1	0.92
X 0.94	.						0.94
X 0.96	.						0.96
X 0.98	.						0.98

	2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0*	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-	-*-
0	I =	1	2	3	4	5	6	7	8	9	10	11	12			
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552			
0 J	Y															
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.15E 01	1.15E 01	1.15E 01	1.14E 01	1.13E 01	1.12E 01	1.11E 01	1.11E 01	1.11E 01	1.11E 01	1.11E 01
19	0.05937	0.00	0.00	0.00	0.00	1.22E 01	1.20E 01	1.19E 01	1.19E 01	1.19E 01	1.19E 01	1.19E 01	1.19E 01	1.19E 01	1.20E 01	1.20E 01
18	0.05594	0.00	0.00	0.00	0.00	1.27E 01	1.23E 01	1.20E 01	1.20E 01	1.20E 01	1.20E 01	1.20E 01	1.20E 01	1.20E 01	1.23E 01	1.23E 01
17	0.05344	0.00	0.00	0.00	1.41E 01	1.33E 01	1.26E 01	1.22E 01	1.21E 01	1.21E 01	1.21E 01	1.22E 01	1.22E 01	1.22E 01	1.25E 01	1.25E 01
16	0.05078	0.00	0.00	0.00	1.48E 01	1.37E 01	1.28E 01	1.24E 01	1.22E 01	1.22E 01	1.22E 01	1.22E 01	1.22E 01	1.24E 01	1.29E 01	1.29E 01
15	0.04812	0.00	0.00	0.00	1.54E 01	1.40E 01	1.29E 01	1.24E 01	1.23E 01	1.23E 01	1.23E 01	1.24E 01	1.28E 01	1.33E 01	1.33E 01	1.33E 01
14	0.04562	0.00	0.00	1.79E 01	1.61E 01	1.43E 01	1.30E 01	1.25E 01	1.24E 01	1.24E 01	1.24E 01	1.27E 01	1.33E 01	1.36E 01	1.36E 01	1.36E 01
13	0.04328	0.00	0.00	1.88E 01	1.67E 01	1.45E 01	1.30E 01	1.24E 01	1.24E 01	1.25E 01	1.31E 01	1.37E 01	1.37E 01	1.38E 01	1.38E 01	1.38E 01
12	0.04094	0.00	0.00	1.95E 01	1.72E 01	1.46E 01	1.30E 01	1.23E 01	1.23E 01	1.28E 01	1.36E 01	1.40E 01	1.39E 01	1.39E 01	1.39E 01	1.39E 01
11	0.03719	0.00	2.37E 01	2.07E 01	1.77E 01	1.47E 01	1.28E 01	1.22E 01	1.25E 01	1.35E 01	1.43E 01	1.44E 01	1.39E 01	1.39E 01	1.39E 01	1.39E 01
10	0.03437	0.00	2.46E 01	2.20E 01	1.82E 01	1.45E 01	1.24E 01	1.20E 01	1.29E 01	1.41E 01	1.46E 01	1.44E 01	1.37E 01	1.37E 01	1.37E 01	1.37E 01
9	0.03219	0.00	2.57E 01	2.27E 01	1.81E 01	1.41E 01	1.20E 01	1.20E 01	1.34E 01	1.45E 01	1.47E 01	1.42E 01	1.34E 01	1.34E 01	1.34E 01	1.34E 01
8	0.03031	3.00E 01	2.73E 01	2.30E 01	1.78E 01	1.36E 01	1.17E 01	1.22E 01	1.38E 01	1.47E 01	1.46E 01	1.40E 01	1.31E 01	1.31E 01	1.31E 01	1.31E 01
7	0.02687	3.00E 01	2.73E 01	2.25E 01	1.69E 01	1.28E 01	1.15E 01	1.27E 01	1.43E 01	1.47E 01	1.42E 01	1.33E 01	1.23E 01	1.23E 01	1.23E 01	1.23E 01
6	0.02187	3.00E 01	2.69E 01	2.13E 01	1.52E 01	1.16E 01	1.15E 01	1.34E 01	1.40E 01	1.37E 01	1.28E 01	1.18E 01	1.07E 01	1.07E 01	1.07E 01	1.07E 01
5	0.01625	3.0														

0	J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	3.83E-01	3.84E-01	3.82E-01	3.79E-01	3.76E-01	3.73E-01	3.69E-01	3.69E-01	0.00
19	0.47500	0.00	0.00	0.00	0.00	4.05E-01	4.00E-01	3.97E-01	3.96E-01	3.96E-01	3.96E-01	3.96E-01	3.99E-01	0.00
18	0.44750	0.00	0.00	0.00	0.00	4.22E-01	4.08E-01	4.01E-01	3.99E-01	4.00E-01	4.00E-01	4.01E-01	4.09E-01	0.00
17	0.42750	0.00	0.00	0.00	4.70E-01	4.42E-01	4.19E-01	4.08E-01	4.04E-01	4.03E-01	4.03E-01	4.05E-01	4.18E-01	0.00

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 55.000

COMPUTED INLET SWIRL NUMBER = 0.9537

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

```
0*- - - - - * - - - - - * - - - - - * - - - - - * - - - - - * - - - - - * - - - - - * - - - - - * - - - - - *
0      I =      1      2      3      4      5      6      7      8      9      10     11     12
      X = 0.00000 0.00000 0.00787 0.01617 0.02539 0.03561 0.04697 0.05957 0.07356 0.08909 0.10632 0.12545
0 J      Y
21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
20 0.06187      0.00      0.00      0.00      0.00      0.00      7.27E 00 1.22E 01 1.34E 01 1.30E 01 1.23E 01 1.15E 01 1.10E 01
19 0.05937      0.00      0.00      0.00      0.00      0.00      9.43E 00 1.34E 01 1.44E 01 1.40E 01 1.33E 01 1.25E 01 1.18E 01
18 0.05594      0.00      0.00      0.00      0.00      0.00      1.16E 01 1.46E 01 1.51E 01 1.45E 01 1.37E 01 1.27E 01 1.18E 01
17 0.05344      0.00      0.00      0.00      0.00      1.51E 01 1.36E 01 1.51E 01 1.52E 01 1.45E 01 1.35E 01 1.24E 01 1.14E 01
16 0.05078      0.00      0.00      0.00      0.00      1.30E 01 1.35E 01 1.45E 01 1.44E 01 1.37E 01 1.26E 01 1.17E 01 1.09E 01
15 0.04812      0.00      0.00      0.00      0.00      1.29E 01 1.35E 01 1.38E 01 1.32E 01 1.23E 01 1.14E 01 1.07E 01 1.02E 01
14 0.04562      0.00      0.00      0.00      1.61E 01 1.39E 01 1.34E 01 1.27E 01 1.16E 01 1.06E 01 9.99E 00 9.67E 00 9.42E 00
13 0.04328      0.00      0.00      0.00      1.34E 01 1.36E 01 1.27E 01 1.13E 01 9.75E 00 8.89E 00 8.70E 00 8.70E 00 8.66E 00
12 0.04094      0.00      0.00      0.00      1.29E 01 1.36E 01 1.19E 01 9.56E 00 7.73E 00 7.25E 00 7.45E 00 7.72E 00 7.87E 00
11 0.03719      0.00      0.00      1.26E 01 1.39E 01 1.36E 01 1.06E 01 6.36E 00 4.56E 00 4.87E 00 5.58E 00 6.15E 00 6.54E 00
10 0.03437      0.00      0.00      1.48E 01 1.61E 01 1.35E 01 8.49E 00 3.43E 00 2.49E 00 3.32E 00 4.26E 00 4.99E 00 5.53E 00
9 0.03219      0.00      0.00      1.84E 01 1.75E 01 1.28E 01 6.07E 00 1.26E 00 1.12E 00 2.20E 00 3.26E 00 4.09E 00 4.74E 00
8 0.03031      0.00      3.00E 01 2.25E 01 1.81E 01 1.17E 01 3.86E 00 -3.31E -01 8.85E -02 1.30E 00 2.42E 00 3.33E 00 4.07E 00
7 0.02687      0.00      3.00E 01 2.41E 01 1.78E 01 9.56E 00 -1.25E -01 -2.51E 00 -1.54E 00 -2.39E -01 9.47E -01 1.96E 00 2.84E 00
6 0.02187      0.00      3.00E 01 2.47E 01 1.62E 01 4.55E 00 -5.16E 00 -4.64E 00 -3.52E 00 -2.26E 00 -1.05E 00 8.75E -02 1.17E 00
5 0.01625      0.00      3.00E 01 2.32E 01 1.11E 01 -6.63E 00 -7.36E 00 -6.45E 00 -5.38E 00 -4.21E 00 -2.97E 00 -1.72E 00 -4.56E -01
4 0.01062      0.00      3.00E 01 1.85E 01 -2.32E 00 -1.01E 01 -8.99E 00 -7.87E 00 -6.80E 00 -5.68E 00 -4.44E 00 -3.09E 00 -1.69E 00
3 0.00562      0.00      3.00E 01 6.85E 00 -1.53E 01 -1.20E 01 -1.00E 01 -8.71E 00 -7.60E 00 -6.49E 00 -5.26E 00 -3.87E 00 -2.38E 00
2 0.00156      0.00      3.00E 01 -1.24E 01 -1.55E 01 -1.26E 01 -1.04E 01 -9.02E 00 -7.89E 00 -6.78E 00 -5.55E 00 -4.15E 00 -2.63E 00
1 -0.00156      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0      I =      13      14      15      16      17      18      19      20      21      22      23
      X = 0.14669 0.17026 0.19643 0.22547 0.25771 0.29349 0.33321 0.37500 0.41679 0.45858 0.50037
0 J      Y
21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
20 0.06187      1.05E 01 9.95E 00 9.46E 00 9.08E 00 8.83E 00 8.66E 00 8.54E 00 8.46E 00 8.41E 00 8.40E 00 8.40E 00
19 0.05937      1.10E 01 1.03E 01 9.77E 00 9.39E 00 9.14E 00 9.00E 00 8.92E 00 8.90E 00 8.91E 00 8.95E 00 8.96E 00
18 0.05594      1.09E 01 1.02E 01 9.71E 00 9.34E 00 9.09E 00 8.93E 00 8.84E 00 8.81E 00 8.81E 00 8.83E 00 8.83E 00
17 0.05344      1.07E 01 1.00E 01 9.55E 00 9.20E 00 8.96E 00 8.80E 00 8.70E 00 8.65E 00 8.64E 00 8.65E 00 8.65E 00
16 0.05078      1.03E 01 9.73E 00 9.30E 00 8.99E 00 8.76E 00 8.61E 00 8.51E 00 8.45E 00 8.42E 00 8.42E 00 8.42E 00
15 0.04812      9.73E 00 9.33E 00 8.99E 00 8.72E 00 8.52E 00 8.38E 00 8.28E 00 8.22E 00 8.19E 00 8.18E 00 8.18E 00
14 0.04562      9.15E 00 8.88E 00 8.63E 00 8.42E 00 8.26E 00 8.14E 00 8.05E 00 7.99E 00 7.96E 00 7.94E 00 7.94E 00
13 0.04328      8.56E 00 8.41E 00 8.25E 00 8.11E 00 7.99E 00 7.89E 00 7.82E 00 7.77E 00 7.73E 00 7.71E 00 7.71E 00
12 0.04094      7.92E 00 7.90E 00 7.84E 00 7.77E 00 7.70E 00 7.63E 00 7.58E 00 7.53E 00 7.50E 00 7.48E 00 7.48E 00
11 0.03719      6.82E 00 7.00E 00 7.12E 00 7.17E 00 7.19E 00 7.18E 00 7.17E 00 7.15E 00 7.13E 00 7.11E 00 7.11E 00
10 0.03437      5.96E 00 6.30E 00 6.54E 00 6.70E 00 6.79E 00 6.84E 00 6.86E 00 6.86E 00 6.85E 00 6.83E 00 6.83E 00
9 0.03219      5.29E 00 5.74E 00 6.09E 00 6.33E 00 6.48E 00 6.57E 00 6.62E 00 6.64E 00 6.64E 00 6.62E 00 6.62E 00
8 0.03031      4.71E 00 5.27E 00 5.70E 00 6.01E 00 6.21E 00 6.34E 00 6.42E 00 6.46E 00 6.46E 00 6.45E 00 6.45E 00
7 0.02687      3.67E 00 4.40E 00 4.99E 00 5.43E 00 5.73E 00 5.93E 00 6.06E 00 6.13E 00 6.16E 00 6.15E 00 6.15E 00
```


[illegible]

0	J	Y												
11	1.00000	0.00	3.12E-02	3.91E-02	4.69E-02	5.47E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	0.00	2.96E-02	3.58E-02	4.46E-02	5.27E-02	5.94E-02	6.05E-02	6.07E-02	6.07E-02	6.06E-02	6.04E-02	6.03E-02	6.03E-02
9	0.80000	0.00	2.79E-02	3.30E-02	4.22E-02	5.07E-02	5.70E-02	5.87E-02	5.90E-02	5.89E-02	5.87E-02	5.84E-02	5.82E-02	5.82E-02
8	0.70000	0.00	2.61E-02	3.06E-02	3.95E-02	4.84E-02	5.47E-02	5.69E-02	5.73E-02	5.71E-02	5.68E-02	5.64E-02	5.60E-02	5.60E-02
7	0.60000	0.00	2.41E-02	2.84E-02	3.67E-02	4.61E-02	5.26E-02	5.51E-02	5.55E-02	5.53E-02	5.48E-02	5.43E-02	5.37E-02	5.37E-02
6	0.50000	0.00	2.21E-02	2.61E-02	3.40E-02	4.37E-02	5.05E-02	5.32E-02	5.37E-02	5.34E-02	5.28E-02	5.21E-02	5.12E-02	5.12E-02
5	0.40000	0.00	1.96E-02	2.36E-02	3.14E-02	4.12E-02	4.84E-02	5.13E-02	5.19E-02	5.15E-02	5.06E-02	4.96E-02	4.85E-02	4.85E-02
4	0.30000	0.00	1.70E-02	2.10E-02	2.86E-02	3.84E-02	4.60E-02	4.93E-02	4.99E-02	4.93E-02	4.82E-02	4.67E-02	4.53E-02	4.53E-02
3	0.20000	0.00	1.37E-02	1.78E-02	2.55E-02	3.56E-02	4.36E-02	4.71E-02	4.77E-02	4.68E-02	4.52E-02	4.33E-02	4.14E-02	4.14E-02
2	0.10000	0.00	9.69E-03	1.36E-02	2.20E-02	3.23E-02	4.07E-02	4.46E-02	4.50E-02	4.37E-02	4.13E-02	3.86E-02	3.61E-02	3.61E-02
1	0.00000	0.00	0.00	3.14E-03	1.66E-02	2.81E-02	3.74E-02	4.15E-02	4.16E-02	3.89E-02	3.51E-02	3.07E-02	2.46E-02	2.46E-02

[illegible]

X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552

0 J	Y	13	14	15	16	17	18	19	20	21	22	23	
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	0.00	0.00	0.00	0.00	2.18E 01	2.20E 01	2.22E 01	2.24E 01	2.29E 01	2.42E 01	2.61E 01	2.82E 01
19	0.05937	0.00	0.00	0.00	0.00	2.26E 01	2.26E 01	2.29E 01	2.33E 01	2.40E 01	2.54E 01	2.73E 01	2.92E 01
18	0.05594	0.00	0.00	0.00	0.00	2.33E 01	2.31E 01	2.33E 01	2.38E 01	2.49E 01	2.64E 01	2.80E 01	2.94E 01
17	0.05344	0.00	0.00	0.00	2.56E 01	2.44E 01	2.39E 01	2.40E 01	2.46E 01	2.58E 01	2.71E 01	2.83E 01	2.94E 01
16	0.05078	0.00	0.00	0.00	2.65E 01	2.49E 01	2.44E 01	2.48E 01	2.57E 01	2.69E 01	2.78E 01	2.86E 01	2.93E 01
15	0.04812	0.00	0.00	0.00	2.75E 01	2.54E 01	2.49E 01	2.56E 01	2.68E 01	2.79E 01	2.85E 01	2.89E 01	2.91E 01
14	0.04562	0.00	0.00	3.28E 01	2.89E 01	2.57E 01	2.53E 01	2.65E 01	2.78E 01	2.87E 01	2.90E 01	2.89E 01	2.88E 01
13	0.04328	0.00	0.00	3.39E 01	2.88E 01	2.53E 01	2.55E 01	2.72E 01	2.87E 01	2.93E 01	2.92E 01	2.88E 01	2.84E 01
12	0.04094	0.00	0.00	3.54E 01	2.87E 01	2.50E 01	2.58E 01	2.80E 01	2.93E 01	2.96E 01	2.93E 01	2.86E 01	2.79E 01
11	0.03719	0.00	4.74E 01	3.79E 01	2.84E 01	2.46E 01	2.64E 01	2.88E 01	2.97E 01	2.96E 01	2.88E 01	2.78E 01	2.68E 01
10	0.03437	0.00	4.99E 01	3.70E 01	2.67E 01	2.40E 01	2.66E 01	2.88E 01	2.95E 01	2.91E 01	2.81E 01	2.70E 01	2.58E 01
9	0.03219	0.00	5.30E 01	3.67E 01	2.57E 01	2.38E 01	2.65E 01	2.84E 01	2.89E 01	2.84E 01	2.74E 01	2.61E 01	2.48E 01
8	0.03031	7.43E 01	5.63E 01	3.60E 01	2.48E 01	2.36E 01	2.62E 01	2.79E 01	2.82E 01	2.76E 01	2.65E 01	2.52E 01	2.39E 01
7	0.02687	7.43E 01	5.48E 01	3.40E 01	2.34E 01	2.31E 01	2.50E 01	2.62E 01	2.64E 01	2.58E 01	2.47E 01	2.34E 01	2.20E 01
6	0.02187	7.43E 01	5.17E 01	3.03E 01	2.06E 01	2.13E 01	2.21E 01	2.26E 01	2.27E 01	2.22E 01	2.12E 01	2.00E 01	1.88E 01
5	0.01625	7.43E 01	4.71E 01	2.45E 01	1.74E 01	1.74E 01	1.74E 01	1.75E 01	1.76E 01	1.72E 01	1.65E 01	1.56E 01	1.45E 01
4	0.01062	7.43E 01	4.09E 01	1.55E 01	1.30E 01	1.22E 01	1.19E 01	1.18E 01	1.18E 01	1.16E 01	1.12E 01	1.05E 01	9.81E 00
3	0.00562	7.43E 01	3.09E 01	7.64E 00	7.29E 00	6.76E 00	6.47E 00	6.38E 00	6.37E 00	6.28E 00	6.06E 00	5.72E 00	5.32E 00
2	0.00156	7.43E 01	8.59E 00	2.12E 00	2.03E 00	1.88E 00	1.80E 00	1.77E 00	1.77E 00	1.74E 00	1.68E 00	1.59E 00	1.48E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23

X = 0.15786 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127

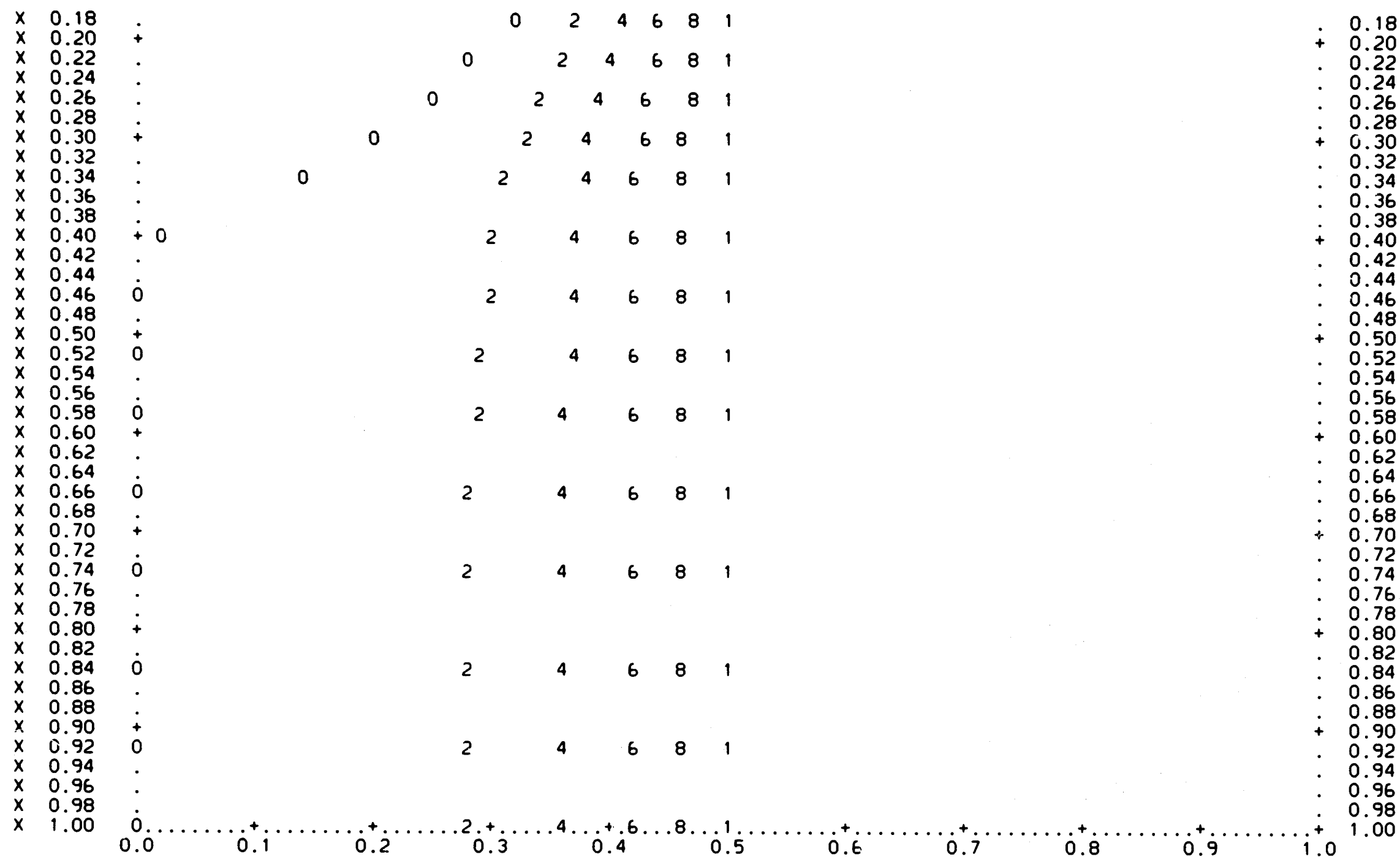
0 J	Y	13	14	15	16	17	18	19	20	21	22	23
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.99E 01	3.11E 01	3.17E 01	3.17E 01	3.14E 01	3.08E 01	2.99E 01	2.91E 01	2.82E 01	2.79E 01	0.00
19	0.05937	3.08E 01	3.18E 01	3.24E 01	3.26E 01	3.25E 01	3.21E 01	3.17E 01	3.11E 01	3.06E 01	3.00E 01	0.00
18	0.05594	3.06E 01	3.14E 01	3.17E 01	3.18E 01	3.17E 01	3.14E 01	3.10E 01	3.05E 01	3.00E 01	2.95E 01	0.00
17	0.05344	3.03E 01	3.08E 01	3.10E 01	3.10E 01	3.08E 01	3.04E 01	3.00E 01	2.96E 01	2.91E 01	2.86E 01	0.00
16	0.05078	2.98E 01	3.01E 01	3.01E 01	3.00E 01	2.97E 01	2.93E 01	2.89E 01	2.84E 01	2.79E 01	2.74E 01	0.00
15	0.04812	2.93E 01	2.93E 01	2.91E 01	2.88E 01	2.85E 01	2.81E 01	2.76E 01	2.71E 01	2.67E 01	2.62E 01	0.00
14	0.04562	2.87E 01	2.85E 01	2.81E 01	2.77E 01	2.73E 01	2.68E 01	2.63E 01	2.59E 01	2.54E 01	2.49E 01	0.00
13	0.04328	2.80E 01	2.76E 01	2.71E 01	2.67E 01	2.62E 01	2.57E 01	2.51E 01	2.47E 01	2.42E 01	2.37E 01	0.00
12	0.04094	2.73E 01	2.67E 01	2.61E 01	2.55E 01	2.50E 01	2.44E 01	2.39E 01	2.34E 01	2.30E 01	2.25E 01	0.00
11	0.03719	2.59E 01	2.51E 01	2.43E 01	2.36E 01	2.30E 01	2.24E 01	2.19E 01	2.14E 01	2.09E 01	2.05E 01	0.00
10	0.03437	2.47E 01	2.37E 01	2.29E 01	2.21E 01	2.15E 01	2.09E 01	2.03E 01	1.99E 01	1.94E 01	1.90E 01	0.00
9	0.03219	2.37E 01	2.26E 01	2.17E 01	2.09E 01	2.03E 01	1.97E 01	1.91E 01	1.86E 01	1.82E 01	1.78E 01	0.00
8	0.03031	2.27E 01	2.16E 01	2.07E 01	1.99E 01	1.92E 01	1.86E 01	1.81E 01	1.76E 01	1.72E 01	1.68E 01	0.00
7	0.02687	2.08E 01	1.96E 01	1.87E 01	1.79E 01	1.72E 01	1.66E 01	1.61E 01	1.57E 01	1.53E 01	1.49E 01	0.00
6	0.02187	1.76E 01	1.65E 01	1.56E 01	1.48E 01	1.42E 01	1.37E 01	1.32E 01	1.28E 01	1.25E 01	1.22E 01	0.00
5	0.01625	1.35E 01	1.26E 01	1.18E 01	1.12E 01	1.07E 01	1.03E 01	9.89E 00	9.59E 00	9.31E 00	9.08E 00	0.00
4	0.01062	9.09E 00	8.44E 00	7.89E 00	7.44E 00	7.08E 00	6.78E 00	6.53E 00	6.32E 00	6.13E 00	5.97E 00	0.00
3	0.00562	4.92E 00	4.56E 00	4.25E 00	4.00E 00	3.80E 00	3.64E 00	3.50E 00	3.38E 00	3.28E 00	3.19E 00	0.00
2	0.00156	1.37E 00	1.27E 00	1.18E 00	1.11E 00	1.06E 00	1.01E 00	9.71E-01	9.39E-01	9.11E-01	8.87E-01	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- PRESSURE -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-

0 I = 1 2 3 4 5 6 7 8 9 10 11 12

X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552

0 J	Y	13	14	15	16	17	18	19	20	21	22	23	
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	0.00	0.00	0.00	0.00	1.85E 03	1.90E 03	1.85E 03	1.84E 03	1.87E 03	1.89E 03	1.91E 03	1.92E 03
19	0.05937	0.00	0.00	0.00	0.00	1.80E 03	1.87E 03	1.82E 03	1.82E 03	1.84E 03	1.86E 03	1.87E 03	1.88E 03



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE

SYMBOL

MAXIMUM VALUES 0.381E 02 0.408E 02 0.430E 02 0.452E 02 0.475E 02 0.500E 02

RADIAL POSITION 2R/D

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

```
0*- - - - - * - - - - - * - - - - - * - - - - - * - - - - - * - - - - - * - - - - - * - - - - - * - - - - - *
0      I =      1      2      3      4      5      6      7      8      9      10     11     12
      X = 0.00000 0.00000 0.00787 0.01617 0.02539 0.03561 0.04697 0.05957 0.07356 0.08909 0.10632 0.12545
0 J      Y
21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
20 0.06187      0.00      0.00      0.00      0.00      0.00      0.00 7.22E 00 1.37E 01 1.46E 01 1.37E 01 1.27E 01 1.19E 01 1.12E 01
19 0.05937      0.00      0.00      0.00      0.00      0.00      0.00 1.22E 01 1.65E 01 1.66E 01 1.53E 01 1.40E 01 1.28E 01 1.19E 01
18 0.05594      0.00      0.00      0.00      0.00      0.00      0.00 1.76E 01 1.97E 01 1.85E 01 1.65E 01 1.46E 01 1.31E 01 1.20E 01
17 0.05344      0.00      0.00      0.00      0.00      0.00 2.44E 01 2.19E 01 2.12E 01 1.89E 01 1.64E 01 1.44E 01 1.29E 01 1.19E 01
16 0.05078      0.00      0.00      0.00      0.00      0.00 2.21E 01 2.17E 01 2.02E 01 1.77E 01 1.53E 01 1.36E 01 1.24E 01 1.16E 01
15 0.04812      0.00      0.00      0.00      0.00      0.00 2.29E 01 2.12E 01 1.79E 01 1.52E 01 1.35E 01 1.25E 01 1.17E 01 1.10E 01
14 0.04562      0.00      0.00      0.00 3.51E 01 2.54E 01 1.91E 01 1.44E 01 1.23E 01 1.15E 01 1.12E 01 1.08E 01 1.03E 01
13 0.04328      0.00      0.00      0.00 2.64E 01 2.13E 01 1.44E 01 1.03E 01 9.32E 00 9.58E 00 9.83E 00 9.79E 00 9.54E 00
12 0.04094      0.00      0.00      0.00 2.32E 01 1.82E 01 1.00E 01 6.30E 00 6.54E 00 7.67E 00 8.42E 00 8.69E 00 8.66E 00
11 0.03719      0.00      0.00 3.37E 01 2.35E 01 1.35E 01 2.62E 00 8.70E -01 2.75E 00 4.76E 00 6.07E 00 6.75E 00 7.06E 00
10 0.03437      0.00      0.00 2.26E 01 1.79E 01 5.62E 00 -2.13E 00 -2.05E 00 3.86E -01 2.70E 00 4.26E 00 5.20E 00 5.76E 00
9 0.03219      0.00      0.00 2.04E 01 1.49E 01 1.31E 00 -4.55E 00 -3.80E 00 -1.24E 00 1.16E 00 2.86E 00 3.97E 00 4.71E 00
8 0.03031      0.00 3.00E 01 2.15E 01 1.25E 01 -1.39E 00 -6.01E 00 -5.02E 00 -2.50E 00 -1.03E -01 1.67E 00 2.91E 00 3.80E 00
7 0.02687      0.00 3.00E 01 2.15E 01 8.81E 00 -5.61E 00 -7.73E 00 -6.71E 00 -4.53E 00 -2.29E 00 -4.65E -01 9.75E -01 2.13E 00
6 0.02187      0.00 3.00E 01 1.96E 01 1.09E 00 -8.95E 00 -9.26E 00 -8.47E 00 -6.96E 00 -5.13E 00 -3.35E 00 -1.71E 00 -2.32E -01
5 0.01625      0.00 3.00E 01 1.43E 01 -1.01E 01 -1.11E 01 -1.06E 01 -9.99E 00 -9.07E 00 -7.74E 00 -6.10E 00 -4.32E 00 -2.57E 00
4 0.01062      0.00 3.00E 01 1.69E 00 -1.45E 01 -1.29E 01 -1.18E 01 -1.12E 01 -1.06E 01 -9.59E 00 -8.14E 00 -6.32E 00 -4.36E 00
3 0.00562      0.00 3.00E 01 -1.49E 01 -1.63E 01 -1.40E 01 -1.26E 01 -1.18E 01 -1.14E 01 -1.06E 01 -9.25E 00 -7.43E 00 -5.38E 00
2 0.00156      0.00 3.00E 01 -2.45E 01 -1.75E 01 -1.45E 01 -1.29E 01 -1.21E 01 -1.16E 01 -1.09E 01 -9.65E 00 -7.83E 00 -5.75E 00
1-0.00156      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0      I =      13      14      15      16      17      18      19      20      21      22      23
      X = 0.14669 0.17026 0.19643 0.22547 0.25771 0.29349 0.33321 0.37500 0.41679 0.45858 0.50037
0 J      Y
21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
20 0.06187 1.07E 01 1.04E 01 1.03E 01 1.03E 01 1.04E 01 1.05E 01 1.05E 01 1.06E 01 1.06E 01 1.07E 01 1.07E 01
19 0.05937 1.12E 01 1.08E 01 1.06E 01 1.06E 01 1.06E 01 1.07E 01 1.07E 01 1.08E 01 1.09E 01 1.10E 01 1.10E 01
18 0.05594 1.13E 01 1.08E 01 1.05E 01 1.04E 01 1.03E 01 1.02E 01 1.02E 01 1.03E 01 1.03E 01 1.04E 01 1.04E 01
17 0.05344 1.12E 01 1.06E 01 1.03E 01 1.01E 01 9.94E 00 9.85E 00 9.80E 00 9.79E 00 9.80E 00 9.82E 00 9.82E 00
16 0.05078 1.09E 01 1.03E 01 9.97E 00 9.71E 00 9.52E 00 9.39E 00 9.31E 00 9.26E 00 9.24E 00 9.24E 00 9.24E 00
15 0.04812 1.04E 01 9.92E 00 9.54E 00 9.26E 00 9.06E 00 8.90E 00 8.80E 00 8.73E 00 8.68E 00 8.67E 00 8.67E 00
14 0.04562 9.84E 00 9.42E 00 9.07E 00 8.79E 00 8.58E 00 8.42E 00 8.30E 00 8.22E 00 8.16E 00 8.14E 00 8.14E 00
13 0.04328 9.21E 00 8.87E 00 8.56E 00 8.30E 00 8.10E 00 7.95E 00 7.83E 00 7.74E 00 7.68E 00 7.65E 00 7.65E 00
12 0.04094 8.48E 00 8.24E 00 8.00E 00 7.78E 00 7.60E 00 7.46E 00 7.35E 00 7.27E 00 7.21E 00 7.17E 00 7.17E 00
11 0.03719 7.15E 00 7.11E 00 7.01E 00 6.88E 00 6.77E 00 6.67E 00 6.58E 00 6.52E 00 6.46E 00 6.42E 00 6.42E 00
10 0.03437 6.07E 00 6.20E 00 6.22E 00 6.18E 00 6.13E 00 6.07E 00 6.02E 00 5.96E 00 5.92E 00 5.88E 00 5.88E 00
9 0.03219 5.19E 00 5.46E 00 5.58E 00 5.63E 00 5.63E 00 5.61E 00 5.58E 00 5.55E 00 5.51E 00 5.47E 00 5.47E 00
8 0.03031 4.43E 00 4.82E 00 5.04E 00 5.15E 00 5.20E 00 5.22E 00 5.22E 00 5.20E 00 5.17E 00 5.14E 00 5.14E 00
7 0.02687 3.01E 00 3.63E 00 4.04E 00 4.29E 00 4.44E 00 4.53E 00 4.58E 00 4.59E 00 4.58E 00 4.55E 00 4.55E 00
6 0.02187 1.01E 00 1.96E 00 2.63E 00 3.10E 00 3.41E 00 3.61E 00 3.73E 00 3.79E 00 3.80E 00 3.79E 00 3.79E 00
5 0.01625 -9.93E -01 2.86E -01 1.25E 00 1.93E 00 2.40E 00 2.72E 00 2.93E 00 3.03E 00 3.08E 00 3.08E 00 3.08E 00
4 0.01062 -2.54E 00 -1.00E 00 1.79E -01 1.04E 00 1.64E 00 2.06E 00 2.33E 00 2.47E 00 2.54E 00 2.55E 00 2.56E 00
3 0.00562 -3.41E 00 -1.73E 00 -4.24E -01 5.38E -01 1.22E 00 1.68E 00 1.99E 00 2.17E 00 2.25E 00 2.27E 00 2.27E 00
```


[illegible]

18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	5.40E 02	5.27E 02	5.11E 02	5.43E 02	7.31E 02	1.07E 03	1.32E 03	1.38E 03
17	0.42750	1.00E 00	1.00E 00	1.00E 00	8.03E 01	3.63E 02	4.62E 02	5.28E 02	6.55E 02	9.51E 02	1.34E 03	1.64E 03	1.74E 03
16	0.40625	1.00E 00	1.00E 00	1.00E 00	5.36E 02	5.30E 02	5.57E 02	6.40E 02	8.55E 02	1.22E 03	1.62E 03	1.92E 03	2.04E 03
15	0.38500	1.00E 00	1.00E 00	1.00E 00	5.57E 02	5.32E 02	6.27E 02	8.11E 02	1.11E 03	1.49E 03	1.87E 03	2.17E 03	2.29E 03
14	0.36500	1.00E 00	1.00E 00	1.03E 02	3.32E 02	5.18E 02	7.51E 02	1.03E 03	1.37E 03	1.73E 03	2.09E 03	2.37E 03	2.50E 03
13	0.34625	1.00E 00	1.00E 00	5.37E 02	4.68E 02	6.59E 02	9.46E 02	1.26E 03	1.60E 03	1.94E 03	2.28E 03	2.55E 03	2.67E 03
12	0.32750	1.00E 00	1.00E 00	4.59E 02	4.33E 02	7.62E 02	1.14E 03	1.48E 03	1.80E 03	2.13E 03	2.46E 03	2.72E 03	2.83E 03
11	0.29750	1.00E 00	1.80E 02	1.95E 02	4.21E 02	9.88E 02	1.48E 03	1.78E 03	2.08E 03	2.41E 03	2.72E 03	2.96E 03	3.05E 03
10	0.27500	1.00E 00	5.11E 02	1.98E 02	5.36E 02	1.23E 03	1.66E 03	1.94E 03	2.25E 03	2.58E 03	2.89E 03	3.12E 03	3.20E 03
9	0.25750	1.00E 00	3.71E 02	1.33E 02	6.33E 02	1.39E 03	1.78E 03	2.05E 03	2.37E 03	2.70E 03	3.01E 03	3.23E 03	3.30E 03
8	0.24250	1.00E 00	7.47E 00	1.18E 02	7.47E 02	1.52E 03	1.87E 03	2.14E 03	2.46E 03	2.80E 03	3.10E 03	3.31E 03	3.39E 03
7	0.21500	1.00E 00	7.83E 00	1.71E 02	9.67E 02	1.74E 03	2.03E 03	2.30E 03	2.62E 03	2.96E 03	3.26E 03	3.46E 03	3.51E 03
6	0.17500	1.00E 00	8.97E 00	3.02E 02	1.44E 03	2.01E 03	2.27E 03	2.52E 03	2.84E 03	3.17E 03	3.45E 03	3.63E 03	3.66E 03
5	0.13000	1.00E 00	1.28E 01	6.09E 02	1.66E 03	2.31E 03	2.52E 03	2.76E 03	3.06E 03	3.37E 03	3.62E 03	3.77E 03	3.79E 03
4	0.08500	1.00E 00	2.63E 01	1.43E 03	2.04E 03	2.56E 03	2.75E 03	2.98E 03	3.26E 03	3.54E 03	3.77E 03	3.89E 03	3.88E 03
3	0.04500	1.00E 00	7.83E 01	1.50E 03	2.38E 03	2.74E 03	2.92E 03	3.15E 03	3.41E 03	3.68E 03	3.89E 03	3.99E 03	3.97E 03
2	0.01250	1.00E 00	1.25E 02	1.90E 03	2.62E 03	2.87E 03	3.04E 03	3.28E 03	3.56E 03	3.83E 03	4.03E 03	4.12E 03	4.08E 03
1-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	1.26289	1.46130	1.68153	1.92598	2.197	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015	
0 J	Y												
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	2.31E 01	2.22E 01	2.13E 01	2.03E 01	1.95E 01	1.88E 01	1.82E 01	1.78E 01	1.73E 01	1.74E 01	1.00E 00	
19	0.47500	6.41E 02	5.46E 02	4.44E 02	3.50E 02	2.71E 02	2.10E 02	1.67E 02	1.39E 02	1.21E 02	1.54E 02	1.00E 00	
18	0.44750	1.30E 03	1.15E 03	9.68E 02	7.92E 02	6.37E 02	5.09E 02	4.14E 02	3.47E 02	2.99E 02	3.87E 02	1.00E 00	
17	0.42750	1.67E 03	1.50E 03	1.29E 03	1.08E 03	8.89E 02	7.30E 02	6.08E 02	5.19E 02	4.55E 02	5.77E 02	1.00E 00	
16	0.40625	1.98E 03	1.81E 03	1.58E 03	1.35E 03	1.13E 03	9.46E 02	8.03E 02	6.98E 02	6.21E 02	7.69E 02	1.00E 00	
15	0.38500	2.24E 03	2.06E 03	1.83E 03	1.57E 03	1.34E 03	1.14E 03	9.79E 02	8.61E 02	7.75E 02	9.40E 02	1.00E 00	
14	0.36500	2.45E 03	2.27E 03	2.02E 03	1.76E 03	1.51E 03	1.30E 03	1.13E 03	9.99E 02	9.05E 02	1.08E 03	1.00E 00	
13	0.34625	2.62E 03	2.43E 03	2.18E 03	1.91E 03	1.65E 03	1.43E 03	1.25E 03	1.11E 03	1.01E 03	1.19E 03	1.00E 00	
12	0.32750	2.77E 03	2.58E 03	2.32E 03	2.04E 03	1.78E 03	1.54E 03	1.35E 03	1.21E 03	1.11E 03	1.29E 03	1.00E 00	
11	0.29750	2.98E 03	2.78E 03	2.51E 03	2.22E 03	1.94E 03	1.70E 03	1.50E 03	1.35E 03	1.24E 03	1.43E 03	1.00E 00	
10	0.27500	3.12E 03	2.91E 03	2.63E 03	2.33E 03	2.04E 03	1.79E 03	1.59E 03	1.44E 03	1.32E 03	1.51E 03	1.00E 00	
9	0.25750	3.21E 03	3.00E 03	2.71E 03	2.41E 03	2.11E 03	1.86E 03	1.65E 03	1.49E 03	1.38E 03	1.56E 03	1.00E 00	
8	0.24250	3.29E 03	3.06E 03	2.77E 03	2.46E 03	2.17E 03	1.91E 03	1.69E 03	1.54E 03	1.42E 03	1.60E 03	1.00E 00	
7	0.21500	3.41E 03	3.17E 03	2.88E 03	2.55E 03	2.25E 03	1.98E 03	1.77E 03	1.60E 03	1.48E 03	1.66E 03	1.00E 00	
6	0.17500	3.54E 03	3.30E 03	3.00E 03	2.66E 03	2.35E 03	2.07E 03	1.85E 03	1.68E 03	1.55E 03	1.72E 03	1.00E 00	
5	0.13000	3.65E 03	3.40E 03	3.09E 03	2.75E 03	2.43E 03	2.14E 03	1.91E 03	1.74E 03	1.61E 03	1.77E 03	1.00E 00	
4	0.08500	3.74E 03	3.48E 03	3.16E 03	2.82E 03	2.49E 03	2.19E 03	1.96E 03	1.78E 03	1.65E 03	1.81E 03	1.00E 00	
3	0.04500	3.81E 03	3.54E 03	3.21E 03	2.87E 03	2.53E 03	2.23E 03	1.99E 03	1.81E 03	1.68E 03	1.84E 03	1.00E 00	
2	0.01250	3.90E 03	3.62E 03	3.27E 03	2.91E 03	2.57E 03	2.26E 03	2.01E 03	1.83E 03	1.69E 03	1.87E 03	1.00E 00	
1-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	

I	X/D	S.S.COEFF.
2	3.148E-02	2.035E-02
3	9.443E-02	1.345E-02
4	1.643E-01	8.365E-03
5	2.419E-01	4.516E-03

18	0.05594	0.00	0.00	0.00	0.00	1.71E 03	1.82E 03	1.77E 03	1.78E 03	1.80E 03	1.81E 03	1.82E 03	1.82E 03
17	0.05344	0.00	0.00	0.00	1.79E 03	1.69E 03	1.75E 03	1.72E 03	1.74E 03	1.76E 03	1.78E 03	1.78E 03	1.77E 03
16	0.05078	0.00	0.00	0.00	1.66E 03	1.67E 03	1.67E 03	1.67E 03	1.70E 03	1.72E 03	1.73E 03	1.73E 03	1.72E 03
15	0.04812	0.00	0.00	0.00	1.47E 03	1.61E 03	1.59E 03	1.61E 03	1.65E 03	1.67E 03	1.68E 03	1.68E 03	1.67E 03
14	0.04562	0.00	0.00	1.96E 03	1.46E 03	1.52E 03	1.51E 03	1.55E 03	1.60E 03	1.62E 03	1.63E 03	1.62E 03	1.61E 03
13	0.04328	0.00	0.00	1.74E 03	1.49E 03	1.43E 03	1.43E 03	1.49E 03	1.54E 03	1.57E 03	1.57E 03	1.57E 03	1.56E 03
12	0.04094	0.00	0.00	1.43E 03	1.45E 03	1.36E 03	1.37E 03	1.40E 03	1.46E 03	1.51E 03	1.51E 03	1.51E 03	1.51E 03
11	0.03719	0.00	1.80E 03	1.32E 03	1.29E 03	1.23E 03	1.26E 03	1.33E 03	1.38E 03	1.40E 03	1.42E 03	1.42E 03	1.42E 03
10	0.03437	0.00	1.40E 03	1.29E 03	1.19E 03	1.14E 03	1.19E 03	1.25E 03	1.29E 03	1.32E 03	1.34E 03	1.35E 03	1.35E 03
9	0.03219	0.00	1.00E 03	1.21E 03	1.11E 03	1.09E 03	1.13E 03	1.18E 03	1.22E 03	1.25E 03	1.28E 03	1.29E 03	1.30E 03
8	0.03031	0.00	8.17E 02	1.11E 03	1.06E 03	1.04E 03	1.08E 03	1.12E 03	1.16E 03	1.20E 03	1.22E 03	1.24E 03	1.26E 03
7	0.02687	0.00	7.97E 02	9.79E 02	9.60E 02	9.57E 02	9.82E 02	1.02E 03	1.05E 03	1.09E 03	1.13E 03	1.16E 03	1.18E 03
6	0.02187	0.00	7.06E 02	8.19E 02	8.11E 02	8.26E 02	8.44E 02	8.69E 02	9.05E 02	9.48E 02	9.94E 02	1.04E 03	1.08E 03
5	0.01625	0.00	5.58E 02	6.47E 02	6.75E 02	6.86E 02	7.04E 02	7.27E 02	7.62E 02	8.10E 02	8.66E 02	9.24E 02	9.78E 02
4	0.01062	0.00	3.73E 02	4.81E 02	5.22E 02	5.66E 02	5.93E 02	6.18E 02	6.54E 02	7.05E 02	7.69E 02	8.37E 02	9.03E 02
3	0.00562	0.00	1.30E 02	4.00E 02	4.42E 02	4.94E 02	5.28E 02	5.57E 02	5.93E 02	6.46E 02	7.13E 02	7.87E 02	8.59E 02
2	0.00156	0.00	0.00	3.09E 02	4.06E 02	4.66E 02	5.04E 02	5.34E 02	5.71E 02	6.24E 02	6.93E 02	7.69E 02	8.43E 02
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.93E 03	1.94E 03	1.93E 03	1.93E 03	1.91E 03	1.90E 03	1.89E 03	1.87E 03	1.86E 03	1.85E 03	0.00	0.00
19	0.05937	1.89E 03	1.89E 03	1.88E 03	1.87E 03	1.86E 03	1.85E 03	1.84E 03	1.83E 03	1.82E 03	1.80E 03	0.00	0.00
18	0.05594	1.82E 03	1.81E 03	1.81E 03	1.80E 03	1.79E 03	1.78E 03	1.77E 03	1.76E 03	1.75E 03	1.74E 03	0.00	0.00
17	0.05344	1.77E 03	1.76E 03	1.75E 03	1.74E 03	1.74E 03	1.73E 03	1.72E 03	1.71E 03	1.70E 03	1.69E 03	0.00	0.00
16	0.05078	1.71E 03	1.70E 03	1.70E 03	1.69E 03	1.68E 03	1.67E 03	1.66E 03	1.66E 03	1.65E 03	1.64E 03	0.00	0.00
15	0.04812	1.66E 03	1.65E 03	1.64E 03	1.63E 03	1.62E 03	1.62E 03	1.61E 03	1.61E 03	1.60E 03	1.60E 03	0.00	0.00
14	0.04562	1.60E 03	1.59E 03	1.59E 03	1.58E 03	1.57E 03	1.57E 03	1.57E 03	1.56E 03	1.56E 03	1.56E 03	0.00	0.00
13	0.04328	1.55E 03	1.54E 03	1.54E 03	1.53E 03	1.53E 03	1.53E 03	1.52E 03	1.52E 03	1.52E 03	1.52E 03	0.00	0.00
12	0.04094	1.50E 03	1.50E 03	1.49E 03	1.49E 03	1.48E 03	1.48E 03	1.48E 03	1.48E 03	1.48E 03	1.48E 03	0.00	0.00
11	0.03719	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.43E 03	1.43E 03	0.00
10	0.03437	1.36E 03	1.36E 03	1.36E 03	1.37E 03	1.37E 03	1.38E 03	1.38E 03	1.38E 03	1.38E 03	1.39E 03	1.39E 03	0.00
9	0.03219	1.31E 03	1.32E 03	1.32E 03	1.33E 03	1.34E 03	1.34E 03	1.35E 03	1.35E 03	1.36E 03	1.36E 03	0.00	0.00
8	0.03031	1.27E 03	1.28E 03	1.29E 03	1.30E 03	1.31E 03	1.32E 03	1.32E 03	1.33E 03	1.34E 03	1.34E 03	0.00	0.00
7	0.02687	1.20E 03	1.22E 03	1.24E 03	1.25E 03	1.26E 03	1.27E 03	1.28E 03	1.29E 03	1.30E 03	1.31E 03	0.00	0.00
6	0.02187	1.11E 03	1.14E 03	1.16E 03	1.18E 03	1.20E 03	1.21E 03	1.23E 03	1.24E 03	1.25E 03	1.26E 03	0.00	0.00
5	0.01625	1.03E 03	1.06E 03	1.10E 03	1.12E 03	1.14E 03	1.16E 03	1.18E 03	1.19E 03	1.21E 03	1.22E 03	0.00	0.00
4	0.01062	9.60E 02	1.01E 03	1.05E 03	1.08E 03	1.10E 03	1.13E 03	1.15E 03	1.16E 03	1.18E 03	1.19E 03	0.00	0.00
3	0.00562	9.23E 02	9.76E 02	1.02E 03	1.05E 03	1.08E 03	1.11E 03	1.13E 03	1.15E 03	1.16E 03	1.18E 03	0.00	0.00
2	0.00156	9.09E 02	9.64E 02	1.01E 03	1.04E 03	1.07E 03	1.10E 03	1.12E 03	1.14E 03	1.16E 03	1.17E 03	0.00	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	6.52E-02	5.45E-02	9.12E-02	9.98E-02	9.74E-02	9.71E-02	1.02E-01	1.09E-01
19	0.05937	0.00	0.00	0.00	0.00	7.20E-02	5.54E-02	8.96E-02	9.64E-02	9.28E-02	9.03E-02	9.16E-02	9.43E-02
18	0.05594	0.00	0.00	0.00	0.00	9.12E-02	6.02E-02	8.93E-02	9.24E-02	8.62E-02	8.02E-02	7.64E-02	7.39E-02
17	0.05344	0.00	0.00	0.00	9.33E-03	8.24E-02	7.07E-02	9.01E-02	8.88E-02	8.02E-02	7.18E-02	6.44E-02	5.88E-02
16	0.05078	0.00	0.00	0.00	3.35E-02	6.79E-02	7.95E-02	8.99E-02	8.42E-02	7.26E-02	6.17E-02	5.10E-02	4.24E-02
15	0.04812	0.00	0.00	0.00	6.16E-02	6.35E-02	8.34E-02	8.72E-02	7.72E-02	6.28E-02	4.99E-02	3.65E-02	2.57E-02
14	0.04562	0.00	0.00	-8.75E-02	4.57E-02	6.17E-02	8.19E-02	8.08E-02	6.79E-02	5.12E-02	3.68E-02	2.21E-02	9.93E-03

12	0.32750	0.00	0.00	1.18E 00	9.56E-01	8.34E-01	8.58E-01	9.32E-01	9.77E-01	9.87E-01	9.75E-01	9.53E-01	9.31E-01
11	0.29750	0.00	1.58E 00	1.26E 00	9.45E-01	8.19E-01	8.80E-01	9.59E-01	9.91E-01	9.87E-01	9.61E-01	9.28E-01	8.95E-01
10	0.27500	0.00	1.66E 00	1.23E 00	8.91E-01	8.00E-01	8.87E-01	9.59E-01	9.83E-01	9.70E-01	9.38E-01	8.99E-01	8.60E-01
9	0.25750	0.00	1.77E 00	1.22E 00	8.56E-01	7.92E-01	8.83E-01	9.48E-01	9.64E-01	9.47E-01	9.12E-01	8.70E-01	8.28E-01
8	0.24250	2.48E 00	1.88E 00	1.20E 00	8.26E-01	7.87E-01	8.73E-01	9.28E-01	9.41E-01	9.21E-01	8.84E-01	8.41E-01	7.97E-01
7	0.21500	2.48E 00	1.83E 00	1.13E 00	7.81E-01	7.71E-01	8.34E-01	8.73E-01	8.80E-01	8.59E-01	8.22E-01	7.79E-01	7.34E-01
6	0.17500	2.48E 00	1.72E 00	1.01E 00	6.86E-01	7.09E-01	7.36E-01	7.54E-01	7.57E-01	7.39E-01	7.07E-01	6.68E-01	6.26E-01
5	0.13000	2.48E 00	1.57E 00	8.15E-01	5.81E-01	5.81E-01	5.81E-01	5.85E-01	5.85E-01	5.73E-01	5.50E-01	5.19E-01	4.84E-01
4	0.08500	2.48E 00	1.36E 00	5.16E-01	4.32E-01	4.08E-01	3.96E-01	3.93E-01	3.93E-01	3.86E-01	3.72E-01	3.51E-01	3.27E-01
3	0.04500	2.48E 00	1.03E 00	2.55E-01	2.43E-01	2.25E-01	2.16E-01	2.13E-01	2.12E-01	2.09E-01	2.02E-01	1.91E-01	1.77E-01
2	0.01250	2.48E 00	2.86E-01	7.07E-02	6.75E-02	6.26E-02	5.99E-02	5.91E-02	5.89E-02	5.81E-02	5.61E-02	5.29E-02	4.92E-02
1-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015

0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	9.98E-01	1.04E 00	1.06E 00	1.06E 00	1.05E 00	1.03E 00	9.98E-01	9.69E-01	9.41E-01	9.28E-01	0.00	0.00
19	0.47500	1.03E 00	1.06E 00	1.08E 00	1.09E 00	1.08E 00	1.07E 00	1.06E 00	1.04E 00	1.02E 00	1.00E 00	0.00	0.00
18	0.44750	1.02E 00	1.05E 00	1.06E 00	1.06E 00	1.06E 00	1.05E 00	1.03E 00	1.02E 00	1.00E 00	9.84E-01	0.00	0.00
17	0.42750	1.01E 00	1.03E 00	1.03E 00	1.03E 00	1.03E 00	1.01E 00	1.00E 00	9.86E-01	9.71E-01	9.53E-01	0.00	0.00
16	0.40625	9.94E-01	1.00E 00	1.00E 00	9.98E-01	9.89E-01	9.76E-01	9.62E-01	9.47E-01	9.32E-01	9.15E-01	0.00	0.00
15	0.38500	9.76E-01	9.76E-01	9.71E-01	9.62E-01	9.49E-01	9.35E-01	9.20E-01	9.04E-01	8.89E-01	8.72E-01	0.00	0.00
14	0.36500	9.56E-01	9.48E-01	9.38E-01	9.25E-01	9.10E-01	8.95E-01	8.78E-01	8.62E-01	8.47E-01	8.31E-01	0.00	0.00
13	0.34625	9.35E-01	9.20E-01	9.05E-01	8.89E-01	8.72E-01	8.55E-01	8.38E-01	8.22E-01	8.06E-01	7.91E-01	0.00	0.00
12	0.32750	9.10E-01	8.90E-01	8.70E-01	8.51E-01	8.33E-01	8.15E-01	7.97E-01	7.81E-01	7.65E-01	7.50E-01	0.00	0.00
11	0.29750	8.64E-01	8.36E-01	8.11E-01	7.88E-01	7.67E-01	7.48E-01	7.30E-01	7.13E-01	6.98E-01	6.84E-01	0.00	0.00
10	0.27500	8.24E-01	7.91E-01	7.63E-01	7.38E-01	7.16E-01	6.96E-01	6.78E-01	6.62E-01	6.47E-01	6.33E-01	0.00	0.00
9	0.25750	7.89E-01	7.54E-01	7.24E-01	6.98E-01	6.75E-01	6.56E-01	6.37E-01	6.21E-01	6.07E-01	5.94E-01	0.00	0.00
8	0.24250	7.56E-01	7.20E-01	6.89E-01	6.63E-01	6.40E-01	6.20E-01	6.02E-01	5.87E-01	5.72E-01	5.60E-01	0.00	0.00
7	0.21500	6.92E-01	6.54E-01	6.22E-01	5.96E-01	5.73E-01	5.54E-01	5.37E-01	5.22E-01	5.09E-01	4.97E-01	0.00	0.00
6	0.17500	5.86E-01	5.49E-01	5.19E-01	4.94E-01	4.73E-01	4.56E-01	4.41E-01	4.28E-01	4.16E-01	4.06E-01	0.00	0.00
5	0.13000	4.51E-01	4.20E-01	3.94E-01	3.73E-01	3.56E-01	3.42E-01	3.30E-01	3.20E-01	3.10E-01	3.03E-01	0.00	0.00
4	0.08500	3.03E-01	2.81E-01	2.63E-01	2.48E-01	2.36E-01	2.26E-01	2.18E-01	2.11E-01	2.04E-01	1.99E-01	0.00	0.00
3	0.04500	1.64E-01	1.52E-01	1.42E-01	1.33E-01	1.27E-01	1.21E-01	1.17E-01	1.13E-01	1.09E-01	1.06E-01	0.00	0.00
2	0.01250	4.55E-02	4.22E-02	3.94E-02	3.71E-02	3.52E-02	3.37E-02	3.24E-02	3.13E-02	3.04E-02	2.96E-02	0.00	0.00
1-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- - - - - DIMENSIONLESS STREAMLINE COORDS - * - - - - -

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363

0 J	Y												
11	1.00000	0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	0.00	2.37E-01	3.12E-01	3.75E-01	4.37E-01	4.79E-01	4.87E-01	4.87E-01	4.86E-01	4.85E-01	4.84E-01	4.83E-01
9	0.80000	0.00	2.23E-01	2.89E-01	3.58E-01	4.18E-01	4.64E-01	4.74E-01	4.75E-01	4.73E-01	4.71E-01	4.69E-01	4.66E-01
8	0.70000	0.00	2.09E-01	2.76E-01	3.48E-01	4.08E-01	4.50E-01	4.63E-01	4.63E-01	4.61E-01	4.57E-01	4.53E-01	4.49E-01
7	0.60000	0.00	1.93E-01	2.59E-01	3.37E-01	3.97E-01	4.38E-01	4.51E-01	4.52E-01	4.48E-01	4.43E-01	4.37E-01	4.31E-01
6	0.50000	0.00	1.77E-01	2.41E-01	3.24E-01	3.86E-01	4.27E-01	4.41E-01	4.40E-01	4.35E-01	4.28E-01	4.20E-01	4.12E-01
5	0.40000	0.00	1.57E-01	2.23E-01	3.10E-01	3.75E-01	4.16E-01	4.30E-01	4.29E-01	4.21E-01	4.12E-01	4.01E-01	3.91E-01
4	0.30000	0.00	1.36E-01	2.02E-01	2.96E-01	3.63E-01	4.05E-01	4.19E-01	4.16E-01	4.07E-01	3.94E-01	3.81E-01	3.68E-01
3	0.20000	0.00	1.10E-01	1.79E-01	2.79E-01	3.51E-01	3.94E-01	4.08E-01	4.04E-01	3.91E-01	3.74E-01	3.57E-01	3.41E-01
2	0.10000	0.00	7.75E-02	1.48E-01	2.59E-01	3.38E-01	3.81E-01	3.95E-01	3.89E-01	3.71E-01	3.50E-01	3.28E-01	3.05E-01
1	0.00000	0.00	0.00	9.81E-02	2.32E-01	3.21E-01	3.68E-01	3.81E-01	3.71E-01	3.47E-01	3.15E-01	2.84E-01	2.48E-01

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299

0 J Y

[illegible]


```

2 0.00156 -3.73E 00-2.00E 00-6.43E-01 3.56E-01 1.06E 00 1.55E 00 1.87E 00 2.06E 00 2.14E 00 2.17E 00 2.17E 00
1-0.00156 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0*-**-*-*-*-*-*-*-*-*-*-*-*-*-*-*-* V VELOCITY *-**-*-*-*-*-*-*-*-*-*-*-*
0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552
0 J Y
21 0.06250 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06062 0.00 0.00 0.00 0.00 0.00 1.34E 00 1.09E 00 1.23E-01-1.20E-01-1.19E-01-9.00E-02-6.94E-02-4.58E-02
19 0.05766 0.00 0.00 0.00 0.00 0.00 5.05E 00 2.30E 00 1.58E-01-4.02E-01-3.95E-01-3.03E-01-2.21E-01-1.42E-01
18 0.05469 0.00 0.00 0.00 0.00 0.00 1.06E 01 2.98E 00-1.11E-01-8.67E-01-7.92E-01-5.78E-01-4.01E-01-2.56E-01
17 0.05211 0.00 0.00 0.00 0.00 6.99E 00 1.04E 01 2.97E 00-5.85E-01-1.39E 00-1.18E 00-8.26E-01-5.62E-01-3.61E-01
16 0.04945 0.00 0.00 0.00 0.00 1.39E 01 1.09E 01 2.77E 00-1.16E 00-1.92E 00-1.54E 00-1.06E 00-7.19E-01-4.69E-01
15 0.04687 0.00 0.00 0.00 0.00 2.13E 01 1.10E 01 2.17E 00-1.78E 00-2.35E 00-1.80E 00-1.24E 00-8.53E-01-5.69E-01
14 0.04445 0.00 0.00 1.05E 01 1.98E 01 1.01E 01 1.27E 00-2.31E 00-2.61E 00-1.96E 00-1.36E 00-9.60E-01-6.55E-01
13 0.04211 0.00 0.00 1.88E 01 1.96E 01 9.01E 00 4.56E-01-2.62E 00-2.71E 00-2.03E 00-1.44E 00-1.05E 00-7.29E-01
12 0.03906 0.00 0.00 2.91E 01 1.94E 01 7.19E 00-5.49E-01-2.77E 00-2.67E 00-2.03E 00-1.50E 00-1.13E 00-8.13E-01
11 0.03578 0.00 1.47E 01 2.76E 01 1.74E 01 4.19E 00-1.13E 00-2.51E 00-2.42E 00-1.93E 00-1.51E 00-1.18E 00-8.72E-01
10 0.03328 0.00 2.32E 01 2.82E 01 1.53E 01 2.54E 00-1.19E 00-2.20E 00-2.17E 00-1.82E 00-1.48E 00-1.19E 00-9.00E-01
9 0.03125 0.00 3.02E 01 2.86E 01 1.32E 01 1.50E 00-1.13E 00-1.91E 00-1.95E 00-1.70E 00-1.44E 00-1.19E 00-9.12E-01
8 0.02859 0.00 3.00E 01 2.83E 01 1.02E 01 3.85E-01-9.95E-01-1.53E 00-1.66E 00-1.55E 00-1.37E 00-1.17E 00-9.15E-01
7 0.02437 0.00 3.02E 01 2.62E 01 4.82E 00-4.96E-01-7.57E-01-1.00E 00-1.21E 00-1.27E 00-1.23E 00-1.09E 00-8.83E-01
6 0.01906 0.00 3.07E 01 1.99E 01-4.38E-01-8.14E-01-5.47E-01-5.61E-01-7.59E-01-9.35E-01-9.95E-01-9.33E-01-7.76E-01
5 0.01344 0.00 2.99E 01 8.25E 00-1.38E 00-8.16E-01-4.01E-01-2.96E-01-4.28E-01-6.09E-01-7.10E-01-7.00E-01-5.96E-01
4 0.00812 0.00 2.41E 01-8.87E-02-1.08E 00-5.96E-01-2.62E-01-1.52E-01-2.21E-01-3.47E-01-4.29E-01-4.37E-01-3.79E-01
3 0.00359 0.00 1.24E 01-1.51E 00-5.92E-01-2.89E-01-1.21E-01-6.29E-02-9.09E-02-1.49E-01-1.89E-01-1.96E-01-1.71E-01
2 0.00000 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
1 0.00000 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 0.15786 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127
0 J Y
21 0.06250 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06062 -2.23E-02-6.42E-03 1.30E-03 3.88E-03 3.98E-03 2.83E-03 2.62E-03 2.21E-03 3.36E-03 1.03E-05 0.00
19 0.05766 -7.36E-02-2.81E-02-4.25E-03 6.08E-03 9.52E-03 9.26E-03 1.01E-02 9.83E-03 9.28E-03-5.58E-06 0.00
18 0.05469 -1.40E-01-6.39E-02-2.17E-02-1.41E-03 7.35E-03 9.89E-03 1.30E-02 1.38E-02 1.30E-02-2.47E-05 0.00
17 0.05211 -2.06E-01-1.02E-01-4.31E-02-1.30E-02 1.36E-03 7.20E-03 1.29E-02 1.50E-02 1.50E-02-3.44E-05 0.00
16 0.04945 -2.77E-01-1.47E-01-7.01E-02-2.93E-02-8.27E-03 1.73E-03 1.05E-02 1.42E-02 1.58E-02-3.57E-05 0.00
15 0.04687 -3.47E-01-1.93E-01-9.97E-02-4.79E-02-1.99E-02-5.37E-03 6.65E-03 1.22E-02 1.55E-02-2.98E-05 0.00
14 0.04445 -4.10E-01-2.37E-01-1.29E-01-6.68E-02-3.21E-02-1.30E-02 2.17E-03 9.54E-03 1.47E-02-2.05E-05 0.00
13 0.04211 -4.68E-01-2.78E-01-1.57E-01-8.56E-02-4.44E-02-2.09E-02-2.61E-03 6.57E-03 1.34E-02-1.13E-05 0.00
12 0.03906 -5.37E-01-3.29E-01-1.93E-01-1.10E-01-6.04E-02-3.12E-02-9.09E-03 2.42E-03 1.14E-02-3.43E-06 0.00
11 0.03578 -5.92E-01-3.74E-01-2.25E-01-1.32E-01-7.56E-02-4.11E-02-1.56E-02-1.92E-03 8.84E-03-6.02E-06 0.00
10 0.03328 -6.22E-01-4.00E-01-2.45E-01-1.47E-01-8.54E-02-4.76E-02-2.00E-02-4.95E-03 6.91E-03-1.49E-05 0.00
9 0.03125 -6.39E-01-4.16E-01-2.58E-01-1.56E-01-9.21E-02-5.21E-02-2.31E-02-7.14E-03 5.39E-03-2.59E-05 0.00
8 0.02859 -6.52E-01-4.31E-01-2.71E-01-1.66E-01-9.92E-02
```


21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	0.00	2.41E-01	4.58E-01	4.85E-01	4.56E-01	4.24E-01	3.97E-01	3.73E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	4.07E-01	5.50E-01	5.53E-01	5.11E-01	4.65E-01	4.26E-01	3.95E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	5.86E-01	6.55E-01	6.17E-01	5.49E-01	4.85E-01	4.37E-01	4.01E-01
17	0.42750	0.00	0.00	0.00	0.00	8.13E-01	7.29E-01	7.06E-01	6.31E-01	5.47E-01	4.79E-01	4.31E-01	3.97E-01
16	0.40625	0.00	0.00	0.00	0.00	7.38E-01	7.22E-01	6.72E-01	5.89E-01	5.11E-01	4.54E-01	4.15E-01	3.85E-01
15	0.38500	0.00	0.00	0.00	0.00	7.63E-01	7.05E-01	5.97E-01	5.06E-01	4.51E-01	4.16E-01	3.90E-01	3.67E-01
14	0.36500	0.00	0.00	0.00	1.17E 00	8.47E-01	6.37E-01	4.81E-01	4.09E-01	3.84E-01	3.72E-01	3.59E-01	3.44E-01
13	0.34625	0.00	0.00	0.00	8.81E-01	7.11E-01	4.81E-01	3.43E-01	3.11E-01	3.19E-01	3.28E-01	3.26E-01	3.18E-01
12	0.32750	0.00	0.00	0.00	7.73E-01	6.06E-01	3.34E-01	2.10E-01	2.18E-01	2.56E-01	2.81E-01	2.90E-01	2.89E-01
11	0.29750	0.00	0.00	1.12E 00	7.85E-01	4.51E-01	8.72E-02	2.90E-02	9.17E-02	1.59E-01	2.02E-01	2.25E-01	2.35E-01
10	0.27500	0.00	0.00	7.52E-01	5.95E-01	1.87E-01	-7.11E-02	-6.84E-02	1.29E-02	9.00E-02	1.42E-01	1.73E-01	1.92E-01
9	0.25750	0.00	0.00	6.81E-01	4.97E-01	4.35E-02	-1.52E-01	-1.27E-01	-4.12E-02	3.88E-02	9.54E-02	1.32E-01	1.57E-01
8	0.24250	0.00	1.00E 00	7.17E-01	4.18E-01	-4.63E-02	-2.00E-01	-1.67E-01	-8.32E-02	-3.43E-03	5.56E-02	9.70E-02	1.27E-01
7	0.21500	0.00	1.00E 00	7.16E-01	2.94E-01	-1.87E-01	-2.58E-01	-2.24E-01	-1.51E-01	-7.64E-02	-1.55E-02	3.25E-02	7.09E-02
6	0.17500	0.00	1.00E 00	6.55E-01	3.65E-02	-2.98E-01	-3.09E-01	-2.82E-01	-2.32E-01	-1.71E-01	-1.12E-01	-5.69E-02	-7.75E-03
5	0.13000	0.00	1.00E 00	4.77E-01	-3.37E-01	-3.71E-01	-3.54E-01	-3.33E-01	-3.02E-01	-2.58E-01	-2.03E-01	-1.44E-01	-8.56E-02
4	0.08500	0.00	1.00E 00	5.64E-02	-4.83E-01	-4.30E-01	-3.94E-01	-3.72E-01	-3.52E-01	-3.20E-01	-2.71E-01	-2.11E-01	-1.45E-01
3	0.04500	0.00	1.00E 00	-4.95E-01	-5.44E-01	-4.68E-01	-4.19E-01	-3.95E-01	-3.79E-01	-3.53E-01	-3.08E-01	-2.48E-01	-1.79E-01
2	0.01250	0.00	1.00E 00	-8.17E-01	-5.84E-01	-4.83E-01	-4.28E-01	-4.03E-01	-3.88E-01	-3.65E-01	-3.22E-01	-2.61E-01	-1.92E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 1.17352 1.36209 1.57141 1.80376 2.06166 2.34793 2.66569 3.00001 3.33434 3.66866 4.00299

0 J Y

21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	3.56E-01	3.47E-01	3.44E-01	3.45E-01	3.47E-01	3.49E-01	3.51E-01	3.53E-01	3.55E-01	3.57E-01	3.57E-01	3.57E-01
19	0.47500	3.74E-01	3.61E-01	3.54E-01	3.53E-01	3.53E-01	3.55E-01	3.58E-01	3.62E-01	3.65E-01	3.68E-01	3.68E-01	3.68E-01
18	0.44750	3.77E-01	3.61E-01	3.51E-01	3.45E-01	3.43E-01	3.41E-01	3.42E-01	3.43E-01	3.44E-01	3.46E-01	3.46E-01	3.46E-01
17	0.42750	3.72E-01	3.55E-01	3.43E-01	3.36E-01	3.31E-01	3.28E-01	3.27E-01	3.26E-01	3.27E-01	3.27E-01	3.27E-01	3.27E-01
16	0.40625	3.62E-01	3.45E-01	3.32E-01	3.24E-01	3.17E-01	3.13E-01	3.10E-01	3.09E-01	3.08E-01	3.08E-01	3.08E-01	3.08E-01
15	0.38500	3.47E-01	3.31E-01	3.18E-01	3.09E-01	3.02E-01	2.97E-01	2.93E-01	2.91E-01	2.89E-01	2.89E-01	2.89E-01	2.89E-01
14	0.36500	3.28E-01	3.14E-01	3.02E-01	2.93E-01	2.86E-01	2.81E-01	2.77E-01	2.74E-01	2.72E-01	2.71E-01	2.71E-01	2.71E-01
13	0.34625	3.07E-01	2.96E-01	2.85E-01	2.77E-01	2.70E-01	2.65E-01	2.61E-01	2.58E-01	2.56E-01	2.55E-01	2.55E-01	2.55E-01
12	0.32750	2.83E-01	2.75E-01	2.67E-01	2.59E-01	2.53E-01	2.49E-01	2.45E-01	2.42E-01	2.40E-01	2.39E-01	2.39E-01	2.39E-01
11	0.29750	2.38E-01	2.37E-01	2.34E-01	2.29E-01	2.26E-01	2.22E-01	2.19E-01	2.17E-01	2.15E-01	2.14E-01	2.14E-01	2.14E-01
10	0.27500	2.02E-01	2.07E-01	2.07E-01	2.06E-01	2.04E-01	2.02E-01	2.01E-01	1.99E-01	1.97E-01	1.96E-01	1.96E-01	1.96E-01
9	0.25750	1.73E-01	1.82E-01	1.86E-01	1.88E-01	1.88E-01	1.87E-01	1.86E-01	1.85E-01	1.84E-01	1.82E-01	1.82E-01	1.82E-01
8	0.24250	1.48E-01	1.61E-01	1.68E-01	1.72E-01	1.73E-01	1.74E-01	1.74E-01	1.73E-01	1.72E-01	1.71E-01	1.71E-01	1.71E-01
7	0.21500	1.00E-01	1.21E-01	1.35E-01	1.43E-01	1.48E-01	1.51E-01	1.53E-01	1.53E-01	1.53E-01	1.52E-01	1.52E-01	1.52E-01
6	0.17500	3.35E-02	6.52E-02	8.78E-02	1.03E-01	1.14E-01	1.20E-01	1.24E-01	1.26E-01	1.27E-01	1.26E-01	1.26E-01	1.26E-01
5	0.13000	-3.31E-02	9.53E-03	4.15E-02	6.43E-02	8.01E-02	9.07E-02	9.75E-02	1.01E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01
4	0.08500	-8.45E-02	-3.34E-02	5.95E-03	3.46E-02	5.47E-02	6.85E-02	7.75E-02	8.25E-02	8.48E-02	8.52E-02	8.52E-02	8.52E-02
3	0.04500	-1.14E-01	-5.77E-02	-1.41E-02	1.79E-02	4.06E-02	5.62E-02	6.65E-02	7.22E-02	7.50E-02	7.56E-02	7.56E-02	7.56E-02
2	0.01250	-1.24E-01	-6.66E-02	-2.14E-02	1.19E-02	3.54E-02	5.17E-02	6.25E-02	6.85E-02	7.15E-02	7.22E-02	7.22E-02	7.22E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- - - - - DIMENSIONLESS V VELOCITY - - - - -
0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = -0.03148 0.03148 0.09443 0.16430 0.24187 0.32796 0.42352 0.52960 0.64735 0.77804 0.92311 1.08415

0 J Y

21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	0.00	0.00	0.00	0.00	4.48E-02	3.65E-02	4.11E-03	-4.00E-03	-3.97E-03	-3.00E-03	-2.31E-03	-1.53E-03
19	0.46125	0.00	0.00	0.00	0.00	1.68E-01	7.67E-02	5.25E-03	-1.34E-02	-1.32E-02	-1.01E-02	-7.35E-03	-4.73E-03
18	0.43750	0.00	0.00	0.00	0.00	3.52E-01	9.94E-02	-3.69E-03	-2.89E-02	-2.64E-02	-1.93E-02	-1.34E-02	-8.53E-03
17	0.41687	0.00	0.00	0.00	2.33E-01	3.48E-01	9.89E-02	-1.95E-02	-4.62E-02	-3.93E-02	-2.75E-02	-1.87E-02	-1.20E-02

6	3.280E-01	4.936E-03
7	4.235E-01	4.870E-03
8	5.296E-01	4.633E-03
9	6.473E-01	4.670E-03
10	7.780E-01	5.194E-03
11	9.231E-01	5.865E-03
12	1.084E 00	6.335E-03
13	1.263E 00	6.524E-03
14	1.461E 00	6.484E-03
15	1.682E 00	6.304E-03
16	1.926E 00	6.053E-03
17	2.197E 00	5.773E-03
18	2.499E 00	5.481E-03
19	2.833E 00	5.199E-03
20	3.167E 00	4.945E-03
21	3.502E 00	4.720E-03
22	3.836E 00	4.682E-03

0- - - - -

1X-AXIS IS XI

Y-AXES ARE

SYMBOL

	00	02	04	06	08	10
	0	2	4	6	8	1
MAXIMUM VALUES	0.384E 00	0.408E 00	0.430E 00	0.451E 00	0.475E 00	0.500E 00

RADIAL POSITION R/D

0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
X 0.00	0	+	2	4	6	8	1	+	+	+	+	0.00
X 0.02	.	0	2	4	6	8	1	+	+	+	+	0.02
X 0.04	.	.	0	2	4	6	8	1	+	+	+	0.04
X 0.06	.	.	.	0	2	4	6	8	1	+	+	0.06
X 0.08	.	.	.	.	0	2	4	6	8	1	+	0.08
X 0.10	+	.	.	.	.	0	2	4	6	8	1	0.10
X 0.12	.	.	.	.	.	.	0	2	4	6	8	0.12
X 0.14	.	.	.	.	.	.	.	0	2	4	6	0.14
X 0.16	.	.	.	.	.	.	.	.	0	2	4	0.16
X 0.18	.	.	.	.	.	.	.	.	.	0	2	0.18

13	0.04328	0.00	0.00	-6.61E-02	1.72E-02	5.72E-02	7.53E-02	7.09E-02	5.60E-02	3.80E-02	2.26E-02	7.67E-03	-5.82E-03
12	0.04094	0.00	0.00	-3.71E-02	2.07E-03	4.65E-02	6.32E-02	5.70E-02	4.09E-02	2.26E-02	7.22E-03	-7.41E-03	-2.18E-02
11	0.03719	0.00	-1.38E-01	-5.34E-02	-1.56E-02	2.05E-02	3.33E-02	2.64E-02	1.11E-02	-5.71E-03	-2.00E-02	-3.31E-02	-4.74E-02
10	0.03437	0.00	-1.26E-01	-7.56E-02	-3.24E-02	-6.32E-03	5.56E-03	-1.31E-03	-1.49E-02	-2.97E-02	-4.23E-02	-5.40E-02	-6.72E-02
9	0.03219	0.00	-1.20E-01	-8.99E-02	-4.86E-02	-3.24E-02	-2.00E-02	-2.49E-02	-3.68E-02	-5.02E-02	-6.10E-02	-7.10E-02	-8.28E-02
8	0.03031	0.00	-1.22E-01	-1.02E-01	-7.13E-02	-5.23E-02	-4.24E-02	-4.65E-02	-5.68E-02	-6.82E-02	-7.74E-02	-8.60E-02	-9.66E-02
7	0.02687	0.00	-1.45E-01	-1.33E-01	-1.07E-01	-9.40E-02	-8.70E-02	-8.90E-02	-9.49E-02	-1.01E-01	-1.07E-01	-1.12E-01	-1.20E-01
6	0.02187	0.00	-1.92E-01	-1.90E-01	-1.75E-01	-1.60E-01	-1.53E-01	-1.51E-01	-1.50E-01	-1.48E-01	-1.47E-01	-1.48E-01	-1.51E-01
5	0.01625	0.00	-2.41E-01	-2.50E-01	-2.34E-01	-2.31E-01	-2.22E-01	-2.14E-01	-2.04E-01	-1.95E-01	-1.87E-01	-1.81E-01	-1.80E-01
4	0.01062	0.00	-2.92E-01	-3.03E-01	-3.01E-01	-2.91E-01	-2.78E-01	-2.63E-01	-2.47E-01	-2.31E-01	-2.17E-01	-2.07E-01	-2.02E-01
3	0.00562	0.00	-3.37E-01	-3.41E-01	-3.41E-01	-3.29E-01	-3.11E-01	-2.91E-01	-2.71E-01	-2.52E-01	-2.35E-01	-2.21E-01	-2.14E-01
2	0.00156	0.00	-3.55E-01	-3.62E-01	-3.57E-01	-3.43E-01	-3.23E-01	-3.01E-01	-2.81E-01	-2.60E-01	-2.41E-01	-2.27E-01	-2.19E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0	J	Y	21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			20	0.06187	1.14E-01	1.17E-01	1.21E-01	1.28E-01	1.37E-01	1.46E-01	1.53E-01	1.55E-01	1.54E-01
			19	0.05937	9.70E-02	9.98E-02	1.03E-01	1.10E-01	1.20E-01	1.29E-01	1.36E-01	1.39E-01	1.38E-01
			18	0.05594	7.33E-02	7.43E-02	7.75E-02	8.35E-02	9.19E-02	1.00E-01	1.06E-01	1.08E-01	1.08E-01
			17	0.05344	5.60E-02	5.58E-02	5.80E-02	6.32E-02	7.03E-02	7.72E-02	8.16E-02	8.32E-02	8.24E-02
			16	0.05078	3.78E-02	3.60E-02	3.75E-02	4.14E-02	4.68E-02	5.21E-02	5.50E-02	5.56E-02	5.43E-02
			15	0.04812	1.93E-02	1.62E-02	1.69E-02	1.95E-02	2.33E-02	2.65E-02	2.75E-02	2.72E-02	2.57E-02
			14	0.04562	1.75E-03	-2.17E-03	-2.26E-03	-9.08E-04	1.11E-03	2.33E-03	1.61E-03	3.46E-04	-1.51E-03
			13	0.04328	-1.47E-02	-1.93E-02	-2.00E-02	-1.99E-02	-1.96E-02	-2.04E-02	-2.25E-02	-2.45E-02	-2.69E-02
			12	0.04094	-3.11E-02	-3.60E-02	-3.74E-02	-3.87E-02	-4.02E-02	-4.28E-02	-4.66E-02	-4.94E-02	-5.18E-02
			11	0.03719	-5.66E-02	-6.23E-02	-6.47E-02	-6.80E-02	-7.26E-02	-7.86E-02	-8.43E-02	-8.80E-02	-9.02E-02
			10	0.03437	-7.56E-02	-8.13E-02	-8.47E-02	-8.93E-02	-9.63E-02	-1.04E-01	-1.12E-01	-1.16E-01	-1.17E-01
			9	0.03219	-9.05E-02	-9.60E-02	-1.00E-01	-1.05E-01	-1.14E-01	-1.23E-01	-1.32E-01	-1.36E-01	-1.38E-01
			8	0.03031	-1.03E-01	-1.08E-01	-1.13E-01	-1.19E-01	-1.29E-01	-1.39E-01	-1.49E-01	-1.53E-01	-1.54E-01
			7	0.02687	-1.25E-01	-1.30E-01	-1.35E-01	-1.42E-01	-1.54E-01	-1.67E-01	-1.77E-01	-1.82E-01	-1.82E-01
			6	0.02187	-1.54E-01	-1.57E-01	-1.63E-01	-1.73E-01	-1.88E-01	-2.03E-01	-2.14E-01	-2.18E-01	-2.17E-01
			5	0.01625	-1.81E-01	-1.83E-01	-1.90E-01	-2.01E-01	-2.19E-01	-2.35E-01	-2.46E-01	-2.50E-01	-2.48E-01
			4	0.01062	-2.01E-01	-2.03E-01	-2.09E-01	-2.22E-01	-2.41E-01	-2.58E-01	-2.69E-01	-2.73E-01	-2.70E-01
			3	0.00562	-2.12E-01	-2.14E-01	-2.21E-01	-2.34E-01	-2.53E-01	-2.71E-01	-2.82E-01	-2.85E-01	-2.82E-01
			2	0.00156	-2.16E-01	-2.18E-01	-2.25E-01	-2.38E-01	-2.58E-01	-2.75E-01	-2.86E-01	-2.89E-01	-2.87E-01
			1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

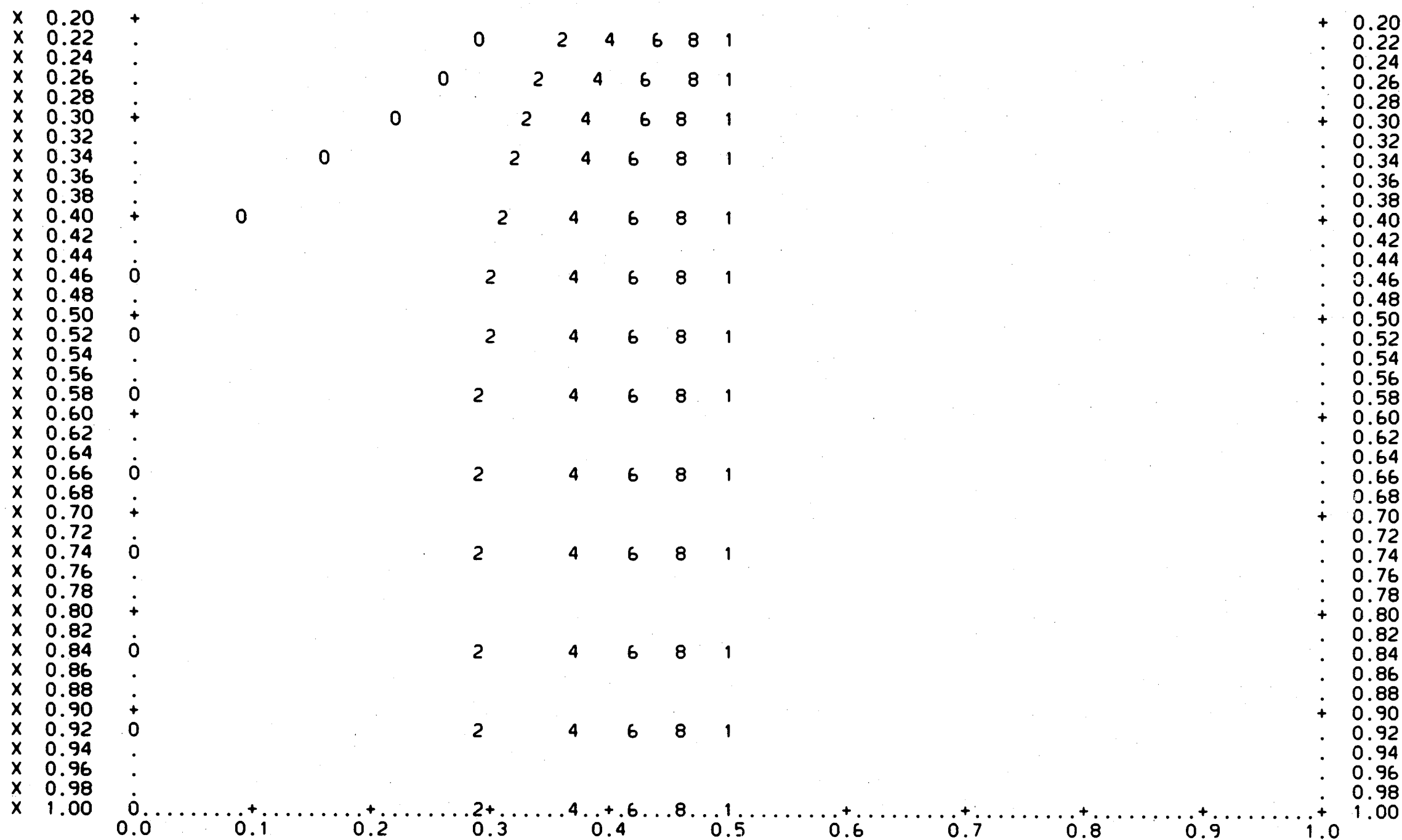
0	J	Y	21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			20	0.06187	0.00	0.00	0.00	0.00	4.92E 00	4.78E 00	3.87E 00	3.30E 00	3.19E 00
			19	0.05937	0.00	0.00	0.00	0.00	2.73E 01	3.21E 01	2.55E 01	2.02E 01	1.84E 01
			18	0.05594	0.00	0.00	0.00	0.00	4.64E 01	3.93E 01	3.15E 01	2.69E 01	2.78E 01
			17	0.05344	0.00	0.00	0.00	1.52E 01	3.45E 01	3.36E 01	3.12E 01	3.12E 01	3.62E 01
			16	0.05078	0.00	0.00	0.00	5.50E 01	4.38E 01	3.76E 01	3.59E 01	3.98E 01	4.71E 01
			15	0.04812	0.00	0.00	0.00	5.60E 01	4.32E 01	4.06E 01	4.40E 01	5.17E 01	5.88E 01
			14	0.04562	0.00	0.00	2.37E 01	3.75E 01	4.11E 01	4.66E 01	5.52E 01	6.37E 01	6.88E 01
			13	0.04328	0.00	0.00	6.54E 01	4.39E 01	4.72E 01	5.57E 01	6.60E 01	7.34E 01	7.65E 01
			12	0.04094	0.00	0.00	4.54E 01	3.77E 01	5.19E 01	6.39E 01	7.45E 01	8.06E 01	8.23E 01
			11	0.03719	0.00	3.19E 01	2.70E 01	3.80E 01	6.48E 01	7.50E 01	8.31E 01	8.77E 01	8.83E 01
			10	0.03437	0.00	6.27E 01	2.69E 01	4.64E 01	7.36E 01	7.67E 01	8.43E 01	8.91E 01	9.01E 01
			9	0.03219	0.00	3.63E 01	2.00E 01	5.46E 01	7.46E 01	7.55E 01	8.32E 01	8.85E 01	9.01E 01

[illegible]

X	0.52	0						2		4		6		8		1	0.52
X	0.54	.														.	0.54
X	0.56	.														.	0.56
X	0.58	0						2		4		6		8		1	0.58
X	0.60	+														+	0.60
X	0.62	.														.	0.62
X	0.64	.														.	0.64
X	0.66	0						2		4		6		8		1	0.66
X	0.68	.														.	0.68
X	0.70	+														+	0.70
X	0.72	.														.	0.72
X	0.74	0						2		4		6		8		1	0.74
X	0.76	.														.	0.76
X	0.78	.														.	0.78
X	0.80	+														+	0.80
X	0.82	.														.	0.82
X	0.84	0						2		4		6		8		1	0.84
X	0.86	.														.	0.86
X	0.88	.														.	0.88
X	0.90	+														+	0.90
X	0.92	0						2		4		6		8		1	0.92
X	0.94	.														.	0.94
X	0.96	.														.	0.96
X	0.98	.														.	0.98
X	1.00	0.....+	0.....+	0.....+	0.....+	0.....+	0.....+	2.....+	0.....+	0.....4.....+	0.....+	0.....6.....+	0.....8.....+	0.....+	0.....1.....	1.00	
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0					

[illegible][illegible]

0	1	2	3	4	5	6	7	8	9	10	11	12	
X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415	
Y													
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.49500	0.00	0.00	0.00	0.00	7.93E-01	8.03E-01	8.11E-01	8.21E-01	8.46E-01	9.00E-01	9.75E-01	1.05E 00
19	0.47500	0.00	0.00	0.00	0.00	8.19E-01	8.24E-01	8.35E-01	8.52E-01	8.85E-01	9.44E-01	1.02E 00	1.08E 00
18	0.44750	0.00	0.00	0.00	0.00	8.46E-01	8.41E-01	8.51E-01	8.74E-01	9.16E-01	9.73E-01	1.03E 00	1.09E 00
17	0.42750	0.00	0.00	0.00	9.24E-01	8.85E-01	8.70E-01	8.78E-01	9.04E-01	9.48E-01	9.96E-01	1.04E 00	1.08E 00
16	0.40625	0.00	0.00	0.00	9.56E-01	9.06E-01	8.94E-01	9.09E-01	9.44E-01	9.85E-01	1.02E 00	1.05E 00	1.07E 00
15	0.38500	0.00	0.00	0.00	9.94E-01	9.25E-01	9.13E-01	9.42E-01	9.85E-01	1.02E 00	1.04E 00	1.05E 00	1.06E 00
14	0.36500	0.00	0.00	1.17E 00	1.04E 00	9.40E-01	9.30E-01	9.75E-01	1.02E 00	1.05E 00	1.06E 00	1.05E 00	1.05E 00
13	0.34625	0.00	0.00	1.22E 00	1.04E 00	9.29E-01	9.41E-01	1.00E 00	1.05E 00	1.07E 00	1.06E 00	1.05E 00	1.03E 00
12	0.32750	0.00	0.00	1.27E 00	1.04E 00	9.19E-01	9.53E-01	1.03E 00	1.07E 00	1.08E 00	1.06E 00	1.04E 00	1.01E 00



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE

SYMBOL

MAXIMUM VALUES 0.384E 02 0.408E 02 0.430E 02 0.451E 02 0.475E 02 0.500E 02

RADIAL POSITION 2R/D

8	0.03031	2.70E 01	9.18E 00	1.91E 01	6.36E 01	7.39E 01	7.37E 01	8.13E 01	8.72E 01	8.95E 01	8.82E 01	8.29E 01	7.37E 01
7	0.02687	2.70E 01	9.31E 00	2.55E 01	7.74E 01	6.98E 01	7.04E 01	7.75E 01	8.41E 01	8.75E 01	8.71E 01	8.23E 01	7.34E 01
6	0.02187	2.70E 01	9.77E 00	4.00E 01	9.41E 01	6.40E 01	6.63E 01	7.24E 01	7.93E 01	8.37E 01	8.41E 01	7.99E 01	7.17E 01
5	0.01625	2.70E 01	1.12E 01	7.06E 01	7.08E 01	6.10E 01	6.31E 01	6.81E 01	7.42E 01	7.88E 01	7.97E 01	7.61E 01	6.87E 01
4	0.01062	2.70E 01	1.59E 01	1.12E 02	6.28E 01	5.95E 01	6.09E 01	6.52E 01	7.04E 01	7.45E 01	7.55E 01	7.24E 01	6.55E 01
3	0.00562	2.70E 01	3.17E 01	8.10E 01	5.98E 01	5.85E 01	5.98E 01	6.36E 01	6.83E 01	7.19E 01	7.29E 01	7.00E 01	6.35E 01
2	0.00156	2.70E 01	4.76E 01	8.25E 01	5.91E 01	5.83E 01	5.96E 01	6.34E 01	6.79E 01	7.13E 01	7.22E 01	6.93E 01	6.30E 01
1	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	4.63E 00	4.30E 00	3.92E 00	3.56E 00	3.26E 00	3.02E 00	2.82E 00	2.66E 00	2.53E 00	2.53E 00	2.70E 01	
19	0.05937	2.39E 01	2.05E 01	1.68E 01	1.35E 01	1.07E 01	8.56E 00	6.98E 00	5.90E 00	5.18E 00	6.09E 00	2.70E 01	
18	0.05594	3.44E 01	2.91E 01	2.36E 01	1.88E 01	1.48E 01	1.17E 01	9.44E 00	7.83E 00	6.70E 00	8.43E 00	2.70E 01	
17	0.05344	3.98E 01	3.34E 01	2.70E 01	2.14E 01	1.69E 01	1.33E 01	1.07E 01	8.91E 00	7.61E 00	9.85E 00	2.70E 01	
16	0.05078	4.48E 01	3.72E 01	2.99E 01	2.37E 01	1.87E 01	1.47E 01	1.19E 01	9.89E 00	8.47E 00	1.11E 01	2.70E 01	
15	0.04812	4.90E 01	4.05E 01	3.24E 01	2.56E 01	2.01E 01	1.59E 01	1.28E 01	1.07E 01	9.20E 00	1.22E 01	2.70E 01	
14	0.04562	5.25E 01	4.30E 01	3.44E 01	2.71E 01	2.13E 01	1.68E 01	1.36E 01	1.14E 01	9.78E 00	1.30E 01	2.70E 01	
13	0.04328	5.52E 01	4.51E 01	3.59E 01	2.82E 01	2.22E 01	1.75E 01	1.42E 01	1.19E 01	1.02E 01	1.35E 01	2.70E 01	
12	0.04094	5.75E 01	4.68E 01	3.72E 01	2.92E 01	2.29E 01	1.81E 01	1.47E 01	1.23E 01	1.06E 01	1.40E 01	2.70E 01	
11	0.03719	6.02E 01	4.89E 01	3.87E 01	3.04E 01	2.38E 01	1.88E 01	1.52E 01	1.28E 01	1.10E 01	1.44E 01	2.70E 01	
10	0.03437	6.15E 01	4.99E 01	3.95E 01	3.09E 01	2.42E 01	1.92E 01	1.55E 01	1.30E 01	1.12E 01	1.45E 01	2.70E 01	
9	0.03219	6.21E 01	5.03E 01	3.98E 01	3.12E 01	2.44E 01	1.93E 01	1.56E 01	1.31E 01	1.13E 01	1.45E 01	2.70E 01	
8	0.03031	6.23E 01	5.05E 01	4.00E 01	3.13E 01	2.45E 01	1.94E 01	1.57E 01	1.31E 01	1.13E 01	1.44E 01	2.70E 01	
7	0.02687	6.22E 01	5.05E 01	4.00E 01	3.13E 01	2.45E 01	1.94E 01	1.57E 01	1.31E 01	1.13E 01	1.42E 01	2.70E 01	
6	0.02187	6.10E 01	4.97E 01	3.94E 01	3.09E 01	2.42E 01	1.91E 01	1.55E 01	1.29E 01	1.11E 01	1.36E 01	2.70E 01	
5	0.01625	5.87E 01	4.81E 01	3.83E 01	3.00E 01	2.35E 01	1.86E 01	1.51E 01	1.26E 01	1.08E 01	1.29E 01	2.70E 01	
4	0.01062	5.63E 01	4.64E 01	3.71E 01	2.92E 01	2.29E 01	1.81E 01	1.47E 01	1.23E 01	1.06E 01	1.23E 01	2.70E 01	
3	0.00562	5.48E 01	4.53E 01	3.63E 01	2.87E 01	2.25E 01	1.79E 01	1.45E 01	1.21E 01	1.04E 01	1.19E 01	2.70E 01	
2	0.00156	5.44E 01	4.50E 01	3.62E 01	2.86E 01	2.25E 01	1.79E 01	1.45E 01	1.21E 01	1.04E 01	1.19E 01	2.70E 01	
1	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	6.85E 03	6.56E 03	4.79E 03	3.77E 03	3.58E 03	4.48E 03	5.82E 03	6.46E 03
19	0.05937	0.00	0.00	0.00	0.00	1.16E 04	1.36E 04	9.66E 03	6.75E 03	5.28E 03	5.32E 03	5.98E 03	6.16E 03
18	0.05594	0.00	0.00	0.00	0.00	2.56E 04	1.96E 04	1.33E 04	9.39E 03	7.65E 03	7.40E 03	7.35E 03	6.80E 03
17	0.05344	0.00	0.00	0.00	1.86E 04	2.28E 04	1.72E 04	1.31E 04	1.07E 04	9.76E 03	9.37E 03	8.67E 03	7.50E 03
16	0.05078	0.00	0.00	0.00	3.66E 04	2.52E 04	1.80E 04	1.44E 04	1.31E 04	1.26E 04	1.17E 04	1.02E 04	8.34E 03
15	0.04812	0.00	0.00	0.00	3.77E 04	2.54E 04	1.91E 04	1.70E 04	1.66E 04	1.57E 04	1.39E 04	1.16E 04	9.13E 03
14	0.04562	0.00	0.00	3.62E 04	3.18E 04	2.46E 04	2.11E 04	2.05E 04	2.00E 04	1.82E 04	1.56E 04	1.26E 04	9.78E 03
13	0.04328	0.00	0.00	5.27E 04	3.15E 04	2.58E 04	2.35E 04	2.35E 04	2.26E 04	2.00E 04	1.67E 04	1.34E 04	1.02E 04
12	0.04094	0.00	0.00	3.05E 04	2.70E 04	2.71E 04	2.51E 04	2.52E 04	2.39E 04	2.10E 04	1.75E 04	1.39E 04	1.06E 04
11	0.03719	0.00	3.77E 04	3.06E 04	3.05E 04	3.25E 04	2.58E 04	2.57E 04	2.43E 04	2.13E 04	1.78E 04	1.43E 04	1.08E 04
10	0.03437	0.00	4.96E 04	3.31E 04	3.67E 04	3.17E 04	2.35E 04	2.40E 04	2.31E 04	2.07E 04	1.75E 04	1.42E 04	1.08E 04
9	0.03219	0.00	2.18E 04	3.42E 04	4.26E 04	2.80E 04	2.11E 04	2.20E 04	2.17E 04	1.98E 04	1.71E 04	1.39E 04	1.07E 04
8	0.03031	4.49E 05	8.25E 04	4.40E 04	4.77E 04	2.47E 04	1.89E 04	2.02E 04	2.03E 04	1.89E 04	1.65E 04	1.36E 04	1.05E 04
7	0.02687	4.49E 05	8.32E 04	5.15E 04	5.23E 04	1.86E 04	1.58E 04	1.70E 04	1.77E 04	1.70E 04	1.53E 04	1.28E 04	1.00E 04
6	0.02187	4.49E 05	8.57E 04	6.61E 04	4.89E 04	1.34E 04	1.26E 04	1.36E 04	1.45E 04	1.45E 04	1.35E 04	1.16E 04	9.16E 03
5	0.01625	4.49E 05	9.30E 04	8.89E 04	2.13E 04	1.05E 04	1.02E 04	1.10E 04	1.18E 04	1.21E 04	1.15E 04	1.01E 04	8.12E 03
4	0.01062	4.49E 05	1.13E 05	9.91E 04	1.32E 04	8.93E 03	8.75E 03	9.31E 03	9.98E 03	1.03E 04	9.94E 03	8.82E 03	7.19E 03

DIMENSIONLESS TURBULENCE ENERGY												
I =	1	2	3	4	5	6	7	8	9	10	11	12
X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
6	0.17500	4.13E 05	4.24E 05	4.32E 05	4.39E 05	4.46E 05	4.51E 05	4.56E 05	4.61E 05	4.65E 05	4.69E 05	0.00
5	0.13000	3.81E 05	3.95E 05	4.07E 05	4.17E 05	4.25E 05	4.32E 05	4.39E 05	4.44E 05	4.49E 05	4.54E 05	0.00
4	0.08500	3.57E 05	3.74E 05	3.89E 05	4.00E 05	4.10E 05	4.18E 05	4.26E 05	4.32E 05	4.38E 05	4.43E 05	0.00
3	0.04500	3.43E 05	3.63E 05	3.79E 05	3.91E 05	4.02E 05	4.11E 05	4.19E 05	4.26E 05	4.32E 05	4.37E 05	0.00
2	0.01250	3.38E 05	3.58E 05	3.75E 05	3.88E 05	3.99E 05	4.08E 05	4.16E 05	4.23E 05	4.29E 05	4.35E 05	0.00
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	5.46E-03	5.31E-03	4.31E-03	3.67E-03	3.54E-03	4.12E-03	4.90E-03
19	0.47500	0.00	0.00	0.00	0.00	3.03E-02	3.56E-02	2.83E-02	2.25E-02	2.04E-02	2.36E-02	2.77E-02
18	0.44750	0.00	0.00	0.00	0.00	5.16E-02	4.36E-02	3.51E-02	2.99E-02	3.09E-02	3.73E-02	4.23E-02
17	0.42750	0.00	0.00	0.00	1.69E-02	3.83E-02	3.73E-02	3.47E-02	3.47E-02	4.02E-02	4.76E-02	5.14E-02
16	0.40625	0.00	0.00	0.00	6.11E-02	4.86E-02	4.18E-02	3.99E-02	4.43E-02	5.23E-02	5.87E-02	6.03E-02
15	0.38500	0.00	0.00	0.00	6.22E-02	4.80E-02	4.52E-02	4.89E-02	5.75E-02	6.53E-02	6.93E-02	6.84E-02
14	0.36500	0.00	0.00	2.63E-02	4.17E-02	4.56E-02	5.18E-02	6.13E-02	7.08E-02	7.65E-02	7.79E-02	7.50E-02
13	0.34625	0.00	0.00	7.26E-02	4.88E-02	5.24E-02	6.19E-02	7.33E-02	8.16E-02	8.50E-02	8.45E-02	8.02E-02
12	0.32750	0.00	0.00	5.05E-02	4.19E-02	5.76E-02	7.10E-02	8.27E-02	8.96E-02	9.15E-02	8.97E-02	8.43E-02
11	0.29750	0.00	3.54E-02	3.00E-02	4.23E-02	7.20E-02	8.34E-02	9.24E-02	9.75E-02	9.82E-02	9.54E-02	8.91E-02
10	0.27500	0.00	6.97E-02	2.99E-02	5.16E-02	8.18E-02	8.52E-02	9.37E-02	9.90E-02	1.00E-01	9.76E-02	9.12E-02
9	0.25750	0.00	4.03E-02	2.22E-02	6.06E-02	8.29E-02	8.39E-02	9.24E-02	9.83E-02	1.00E-01	9.81E-02	9.19E-02
8	0.24250	3.00E-02	1.02E-02	2.12E-02	7.07E-02	8.21E-02	8.19E-02	9.03E-02	9.68E-02	9.95E-02	9.80E-02	9.21E-02
7	0.21500	3.00E-02	1.03E-02	2.83E-02	8.60E-02	7.76E-02	7.82E-02	8.61E-02	9.34E-02	9.73E-02	9.68E-02	9.14E-02
6	0.17500	3.00E-02	1.09E-02	4.45E-02	1.05E-01	7.12E-02	7.37E-02	8.05E-02	8.81E-02	9.30E-02	9.34E-02	8.88E-02
5	0.13000	3.00E-02	1.25E-02	7.84E-02	7.87E-02	6.77E-02	7.01E-02	7.57E-02	8.25E-02	8.75E-02	8.85E-02	8.46E-02
4	0.08500	3.00E-02	1.77E-02	1.25E-01	6.98E-02	6.61E-02	6.77E-02	7.24E-02	7.82E-02	8.27E-02	8.39E-02	8.04E-02
3	0.04500	3.00E-02	3.52E-02	9.00E-02	6.65E-02	6.50E-02	6.64E-02	7.07E-02	7.59E-02	7.99E-02	8.10E-02	7.78E-02
2	0.01250	3.00E-02	5.29E-02	9.17E-02	6.57E-02	6.48E-02	6.62E-02	7.04E-02	7.54E-02	7.93E-02	8.02E-02	7.70E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	5.14E-03	4.76E-03	4.35E-03	3.96E-03	3.63E-03	3.35E-03	3.13E-03	2.95E-03	2.81E-03	2.81E-03	3.00E-02
19	0.47500	2.65E-02	2.28E-02	1.87E-02	1.50E-02	1.19E-02	9.51E-03	7.76E-03	6.56E-03	5.75E-03	6.76E-03	3.00E-02
18	0.44750	3.82E-02	3.23E-02	2.63E-02	2.09E-02	1.65E-02	1.30E-02	1.05E-02	8.70E-03	7.44E-03	9.37E-03	3.00E-02
17	0.42750	4.43E-02	3.71E-02	3.00E-02	2.38E-02	1.88E-02	1.48E-02	1.19E-02	9.90E-03	8.46E-03	1.09E-02	3.00E-02
16	0.40625	4.97E-02	4.14E-02	3.33E-02	2.63E-02	2.07E-02	1.64E-02	1.32E-02	1.10E-02	9.42E-03	1.24E-02	3.00E-02
15	0.38500	5.45E-02	4.49E-02	3.60E-02	2.84E-02	2.24E-02	1.77E-02	1.43E-02	1.19E-02	1.02E-02	1.35E-02	3.00E-02
14	0.36500	5.83E-02	4.78E-02	3.82E-02	3.01E-02	2.36E-02	1.87E-02	1.51E-02	1.26E-02	1.09E-02	1.44E-02	3.00E-02
13	0.34625	6.13E-02	5.01E-02	3.99E-02	3.14E-02	2.46E-02	1.95E-02	1.58E-02	1.32E-02	1.14E-02	1.50E-02	3.00E-02
12	0.32750	6.38E-02	5.20E-02	4.13E-02	3.25E-02	2.55E-02	2.01E-02	1.63E-02	1.36E-02	1.18E-02	1.55E-02	3.00E-02
11	0.29750	6.69E-02	5.43E-02	4.30E-02	3.37E-02	2.65E-02	2.09E-02	1.69E-02	1.42E-02	1.22E-02	1.60E-02	3.00E-02
10	0.27500	6.83E-02	5.54E-02	4.39E-02	3.44E-02	2.69E-02	2.13E-02	1.72E-02	1.44E-02	1.25E-02	1.61E-02	3.00E-02
9	0.25750	6.89E-02	5.59E-02	4.42E-02	3.47E-02	2.72E-02	2.15E-02	1.74E-02	1.45E-02	1.26E-02	1.61E-02	3.00E-02
8	0.24250	6.92E-02	5.61E-02	4.44E-02	3.48E-02	2.73E-02	2.15E-02	1.74E-02	1.46E-02	1.26E-02	1.60E-02	3.00E-02
7	0.21500	6.91E-02	5.61E-02	4.44E-02	3.48E-02	2.72E-02	2.15E-02	1.74E-02	1.46E-02	1.26E-02	1.58E-02	3.00E-02
6	0.17500	6.78E-02	5.52E-02	4.38E-02	3.43E-02	2.69E-02	2.12E-02	1.72E-02	1.44E-02	1.24E-02	1.52E-02	3.00E-02
5	0.13000	6.53E-02	5.34E-02	4.25E-02	3.34E-02	2.62E-02	2.07E-02	1.68E-02	1.40E-02	1.21E-02	1.44E-02	3.00E-02
4	0.08500	6.26E-02	5.15E-02	4.12E-02	3.25E-02	2.54E-02	2.01E-02	1.63E-02	1.36E-02	1.17E-02	1.37E-02	3.00E-02
3	0.04500	6.09E-02	5.03E-02	4.04E-02	3.19E-02	2.50E-02	1.98E-02	1.61E-02	1.35E-02	1.16E-02	1.33E-02	3.00E-02
2	0.01250	6.04E-02	5.00E-02	4.02E-02	3.18E-02	2.50E-02	1.98E-02	1.61E-02	1.35E-02	1.16E-02	1.32E-02	3.00E-02

OITER NO	DIMENSIONLESS STREAMLINE PLOT											FIELD VALUES AT MONITORING LOCATION(22, 8)			
	I--- UMON	ABSOLUTE VMON	RESIDUAL WMON	SOURCE MASS	SUMS TKIN	---I DISP	I--- U	---	---	---	---	V	W	P	D
1	0.1361E-01	0.1504E-01	0.1109E 00	0.5761E-02	0.8213E-02	0.4205E 10	0.5428E 01	-0.7725E-04	0.1679E 02	0.1846E 04	0.2520E 04				
2	0.1331E-01	0.1510E 00	0.9421E-01	0.1617E-01	0.1296E-01	0.7477E 10	0.5428E 01	-0.8536E-04	0.1680E 02	0.1992E 04	0.2521E 04				
3	0.7704E-01	0.2185E 00	0.8527E-01	0.2252E-01	0.1643E-01	0.9623E 10	0.5428E 01	-0.5627E-04	0.1680E 02	0.2123E 04	0.2521E 04				
4	0.1946E 00	0.1972E 00	0.7951E-01	0.1533E-01	0.1788E-01	0.9424E 10	0.5428E 01	-0.5914E-04	0.1680E 02	0.2092E 04	0.2521E 04				
5	0.2034E 00	0.2130E 00	0.7622E-01	0.1543E-01	0.1846E-01	0.8019E 10	0.5428E 01	-0.6751E-04	0.1681E 02	0.2062E 04	0.2521E 04				
6	0.2225E 00	0.2150E 00	0.7466E-01	0.1682E-01	0.1982E-01	0.7025E 10	0.5428E 01	-0.7727E-04	0.1681E 02	0.2028E 04	0.2522E 04				
7	0.2300E 00	0.2189E 00	0.7386E-01	0.1708E-01	0.2053E-01	0.6611E 10	0.5428E 01	-0.8796E-04	0.1682E 02	0.2000E 04	0.2522E 04				
8	0.2324E 00	0.2221E 00	0.7321E-01	0.1744E-01	0.2101E-01	0.6114E 10	0.5428E 01	-0.9816E-04	0.1682E 02	0.1977E 04	0.2522E 04				
9	0.2349E 00	0.2234E 00	0.7238E-01	0.1866E-01	0.2151E-01	0.5778E 10	0.5428E 01	-0.1067E-03	0.1683E 02	0.1959E 04	0.2522E 04				
10	0.2371E 00	0.2228E 00	0.7147E-01	0.1946E-01	0.2210E-01	0.5212E 10	0.5428E 01	-0.1154E-03	0.1683E 02	0.1946E 04	0.2523E 04				
11	0.2386E 00	0.2220E 00	0.7112E-01	0.2007E-01	0.2279E-01	0.4972E 10	0.5428E 01	-0.1229E-03	0.1684E 02	0.1938E 04	0.2523E 04				
12	0.2401E 00	0.2205E 00	0.7097E-01	0.2078E-01	0.2371E-01	0.4831E 10	0.5428E 01	-0.1306E-03	0.1684E 02	0.1932E 04	0.2523E 04				
13	0.2431E 00	0.2175E 00	0.7068E-01	0.2149E-01	0.2474E-01	0.4751E 10	0.5428E 01	-0.1371E-03	0.1684E 02	0.1928E 04	0.2524E 04				
14	0.2450E 00	0.2133E 00	0.7052E-01	0.2218E-01	0.2578E-01	0.4701E 10	0.5428E 01	-0.1430E-03	0.1685E 02	0.1926E 04	0.2524E 04				
15	0.2457E 00	0.2081E 00	0.7027E-01	0.2283E-01	0.2689E-01	0.4660E 10	0.5428E 01	-0.1489E-03	0.1685E 02	0.1925E 04	0.2524E 04				
16	0.2456E 00	0.2025E 00	0.7005E-01	0.2325E-01	0.2799E-01	0.4617E 10	0.5428E 01	-0.1531E-03	0.1686E 02	0.1926E 04	0.2525E 04				
17	0.2459E 00	0.1953E 00	0.6995E-01	0.2345E-01	0.2913E-01	0.4562E 10	0.5428E 01	-0.1570E-03	0.1686E 02	0.1927E 04	0.2525E 04				
18	0.2462E 00	0.1886E 00	0.6977E-01	0.2348E-01	0.2997E-01	0.4496E 10	0.5428E 01	-0.1606E-03	0.1687E 02	0.1930E 04	0.2525E 04				
19	0.2453E 00	0.1818E 00	0.6960E-01	0.2327E-01	0.3044E-01	0.4417E 10	0.5428E 01	-0.1638E-03	0.1687E 02	0.1933E 04	0.2526E 04				
20	0.2437E 00	0.1754E 00	0.6931E-01	0.2290E-01	0.3090E-01	0.4325E 10	0.5428E 01	-0.1662E-03	0.1688E 02	0.1936E 04	0.2526E 04				
21	0.2417E 00	0.1702E 00	0.6900E-01	0.2247E-01	0.3113E-01	0.4220E 10	0.5427E 01	-0.1684E-03	0.1688E 02	0.1940E 04	0.2527E 04				
22	0.2389E 00	0.1674E 00	0.6870E-01	0.2192E-01	0.3112E-01	0.4102E 10	0.5427E 01	-0.1694E-03	0.1689E 02	0.1943E 04	0.2527E 04				
23	0.2369E 00	0.1649E 00	0.6837E-01	0.2142E-01	0.3109E-01	0.3968E 10	0.5427E 01	-0.1702E-03	0.1689E 02	0.1946E 04	0.2528E 04				
24	0.2349E 00	0.1626E 00	0.6799E-01	0.2097E-01	0.3095E-01	0.3819E 10	0.5427E 01	-0.1704E-03	0.1690E 02	0.1950E 04	0.2528E 04				
25	0.2331E 00	0.1604E 00	0.6758E-01	0.2066E-01	0.3068E-01	0.3665E 10	0.5427E 01	-0.1696E-03	0.1690E 02	0.1953E 04	0.2528E 04				
26	0.2309E 00	0.1584E 00	0.6705E-01	0.2039E-01	0.3045E-01	0.3500E 10	0.5427E 01	-0.1692E-03	0.1691E 02	0.1956E 04	0.2529E 04				
27	0.2282E 00	0.1572E 00	0.6648E-01	0.2015E-01	0.3022E-01	0.3321E 10	0.5427E 01	-0.1676E-03	0.1691E 02	0.1959E 04	0.2529E 04				
28	0.2248E 00	0.1555E 00	0.6597E-01	0.1999E-01	0.2991E-01	0.3129E 10	0.5427E 01	-0.1651E-03	0.1692E 02	0.1962E 04	0.2530E 04				
29	0.2211E 00	0.1537E 00	0.6542E-01	0.1986E-01	0.2969E-01	0.2927E 10	0.5427E 01	-0.1624E-03	0.1692E 02	0.1964E 04	0.2530E 04				
30	0.2176E 00	0.1513E 00	0.6482E-01	0.1979E-01	0.2955E-01	0.2716E 10	0.5427E 01	-0.1596E-03	0.1693E 02	0.1967E 04	0.2531E 04				
31	0.2148E 00	0.1492E 00	0.6427E-01	0.1982E-01	0.2951E-01	0.2505E 10	0.5426E 01	-0.1565E-03	0.1693E 02	0.1969E 04	0.2532E 04				
32	0.2120E 00	0.1470E 00	0.6370E-01	0.1995E-01	0.2953E-01	0.2309E 10	0.5426E 01	-0.1542E-03	0.1694E 02	0.1971E 04	0.2532E 04				
33	0.2089E 00	0.1445E 00	0.6315E-01	0.2009E-01	0.2958E-01	0.2120E 10	0.5426E 01	-0.1522E-03	0.1694E 02	0.1972E 04	0.2533E 04				
34	0.2054E 00	0.1420E 00	0.6258E-01	0.2040E-01	0.2985E-01	0.1928E 10	0.5426E 01	-0.1512E-03	0.1695E 02	0.1974E 04	0.2533E 04				
35	0.2021E 00	0.1400E 00	0.6200E-01	0.2075E-01	0.3025E-01	0.1736E 10	0.5426E 01	-0.1517E-03	0.1695E 02	0.1975E 04	0.2534E 04				
36	0.1988E 00	0.1381E 00	0.6143E-01	0.2116E-01	0.3079E-01	0.1601E 10	0.5426E 01	-0.1543E-03	0.1696E 02	0.1976E 04	0.2535E 04				
37	0.1953E 00	0.1363E 00	0.6095E-01	0.2158E-01	0.3146E-01	0.1491E 10	0.5426E 01	-0.1598E-03	0.1696E 02	0.1977E 04	0.2536E 04				
38	0.1916E 00	0.1343E 00	0.6059E-01	0.2207E-01	0.3207E-01	0.1371E 10	0.5426E 01	-0.1681E-03	0.1697E 02	0.1978E 04	0.2536E 04				
39	0.1880E 00	0.1323E 00	0.6027E-01	0.2264E-01	0.3267E-01	0.1256E 10	0.5426E 01	-0.1795E-03	0.1697E 02	0.1979E 04	0.2537E 04				
40	0.1843E 00	0.1302E 00	0.6001E-01	0.2328E-01	0.3334E-01	0.1146E 10	0.5425E 01	-0.1945E-03	0.1698E 02	0.1980E 04	0.2538E 04				
41	0.1802E 00	0.1279E 00	0.5984E-01	0.2379E-01	0.3382E-01	0.1026E 10	0.5425E 01	-0.2109E-03	0.1698E 02	0.1981E 04	0.2539E 04				
42	0.1762E 00	0.1245E 00	0.5967E-01	0.2401E-01	0.3426E-01	0.9496E 09	0.5425E 01	-0.2295E-03	0.1699E 02	0.1981E 04	0.2540E 04				
43	0.1724E 00	0.1220E 00	0.5953E-01	0.2437E-01	0.3464E-01	0.8783E 09	0.5425E 01	-0.2521E-03	0.1700E 02	0.1982E 04	0.2541E 04				
44	0.1690E 00	0.1193E 00	0.5937E-01	0.2478E-01	0.3500E-01	0.8012E 09	0.5425E 01	-0.2792E-03	0.1700E 02	0.1983E 04	0.2542E 04				
45	0.1662E 00	0.1166E 00	0.5922E-01	0.2525E-01	0.3533E-01	0.7763E 09	0.5424E 01	-0.3115E-03	0.1701E 02	0.1983E 04	0.2543E 04				
46	0.1636E 00	0.1139E 00	0.5914E-01	0.2577E-01	0.3558E-01	0.7764E 09	0.5424E 01	-0.3482E-03	0.1701E 02	0.1983E 04	0.2544E 04				
47	0.1613E 00	0.1112E 00	0.5901E-01	0.2630E-01	0.3573E-01	0.7639E 09	0.5424E 01	-0.3902E-03	0.1702E 02	0.1984E 04	0.2545E 04				
48	0.1590E 00	0.1088E 00	0.5883E-01	0.2684E-01	0.3582E-01	0.7410E 09	0.5423E 01	-0.4371E-03	0.1702E 02	0.1984E 04	0.2547E 04				
49	0.1565E 00	0.1067E 00	0.5867E-01	0.2754E-01	0.3579E-01	0.7095E 09	0.5423E 01	-0.4896E-03	0.1703E 02	0.1984E 04	0.2548E 04				
50	0.1540E 00	0.1045E 00	0.5846E-01	0.2817E-01	0.3565E-01	0.6718E 09	0.5422E 01	-0.5482E-03	0.1703E 02	0.1984E 04	0.2550E 04				

17	0.05344	0.00	0.00	0.00	2.00E 03	1.91E 03	1.97E 03	1.95E 03	1.97E 03	2.00E 03	2.01E 03	2.01E 03	2.00E 03
16	0.05078	0.00	0.00	0.00	1.85E 03	1.88E 03	1.88E 03	1.89E 03	1.92E 03	1.94E 03	1.95E 03	1.95E 03	1.94E 03
15	0.04812	0.00	0.00	0.00	1.64E 03	1.81E 03	1.79E 03	1.82E 03	1.86E 03	1.89E 03	1.89E 03	1.88E 03	1.87E 03
14	0.04562	0.00	0.00	2.20E 03	1.63E 03	1.70E 03	1.70E 03	1.75E 03	1.80E 03	1.82E 03	1.83E 03	1.82E 03	1.81E 03
13	0.04328	0.00	0.00	1.95E 03	1.66E 03	1.60E 03	1.61E 03	1.68E 03	1.74E 03	1.76E 03	1.76E 03	1.75E 03	1.74E 03
12	0.04094	0.00	0.00	1.58E 03	1.61E 03	1.50E 03	1.53E 03	1.61E 03	1.66E 03	1.69E 03	1.69E 03	1.69E 03	1.68E 03
11	0.03719	0.00	2.13E 03	1.47E 03	1.42E 03	1.36E 03	1.41E 03	1.49E 03	1.54E 03	1.57E 03	1.58E 03	1.58E 03	1.58E 03
10	0.03437	0.00	1.66E 03	1.44E 03	1.30E 03	1.26E 03	1.32E 03	1.39E 03	1.44E 03	1.47E 03	1.48E 03	1.49E 03	1.50E 03
9	0.03219	0.00	1.20E 03	1.34E 03	1.21E 03	1.19E 03	1.25E 03	1.31E 03	1.36E 03	1.39E 03	1.41E 03	1.43E 03	1.44E 03
8	0.03031	0.00	9.78E 02	1.24E 03	1.15E 03	1.14E 03	1.18E 03	1.24E 03	1.29E 03	1.32E 03	1.35E 03	1.37E 03	1.39E 03
7	0.02687	0.00	9.26E 02	1.08E 03	1.03E 03	1.04E 03	1.07E 03	1.11E 03	1.16E 03	1.20E 03	1.24E 03	1.27E 03	1.30E 03
6	0.02187	0.00	7.99E 02	8.91E 02	8.81E 02	8.90E 02	9.08E 02	9.38E 02	9.81E 02	1.03E 03	1.08E 03	1.14E 03	1.18E 03
5	0.01625	0.00	6.21E 02	6.93E 02	7.12E 02	7.31E 02	7.47E 02	7.72E 02	8.14E 02	8.70E 02	9.36E 02	1.00E 03	1.07E 03
4	0.01062	0.00	4.19E 02	5.27E 02	5.64E 02	5.99E 02	6.22E 02	6.48E 02	6.89E 02	7.49E 02	8.24E 02	9.04E 02	9.80E 02
3	0.00562	0.00	1.65E 02	4.06E 02	4.71E 02	5.20E 02	5.50E 02	5.78E 02	6.19E 02	6.81E 02	7.60E 02	8.47E 02	9.31E 02
2	0.00156	0.00	0.00	3.07E 02	4.31E 02	4.89E 02	5.23E 02	5.52E 02	5.93E 02	6.55E 02	7.37E 02	8.26E 02	9.12E 02
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.19E 03	2.19E 03	2.19E 03	2.18E 03	2.16E 03	2.15E 03	2.13E 03	2.11E 03	2.10E 03	2.08E 03	0.00	0.00
19	0.05937	2.14E 03	2.13E 03	2.13E 03	2.12E 03	2.10E 03	2.09E 03	2.07E 03	2.06E 03	2.05E 03	2.03E 03	0.00	0.00
18	0.05594	2.05E 03	2.05E 03	2.04E 03	2.03E 03	2.01E 03	2.00E 03	1.99E 03	1.98E 03	1.97E 03	1.96E 03	0.00	0.00
17	0.05344	1.99E 03	1.98E 03	1.97E 03	1.96E 03	1.95E 03	1.94E 03	1.93E 03	1.92E 03	1.91E 03	1.90E 03	0.00	0.00
16	0.05078	1.93E 03	1.91E 03	1.90E 03	1.89E 03	1.88E 03	1.88E 03	1.87E 03	1.86E 03	1.85E 03	1.84E 03	0.00	0.00
15	0.04812	1.86E 03	1.85E 03	1.84E 03	1.83E 03	1.82E 03	1.81E 03	1.81E 03	1.80E 03	1.79E 03	1.79E 03	0.00	0.00
14	0.04562	1.79E 03	1.78E 03	1.77E 03	1.77E 03	1.76E 03	1.75E 03	1.75E 03	1.75E 03	1.74E 03	1.74E 03	0.00	0.00
13	0.04328	1.73E 03	1.72E 03	1.72E 03	1.71E 03	1.71E 03	1.70E 03	1.70E 03	1.70E 03	1.70E 03	1.69E 03	0.00	0.00
12	0.04094	1.67E 03	1.67E 03	1.66E 03	1.66E 03	1.65E 03	1.65E 03	1.65E 03	1.65E 03	1.65E 03	1.65E 03	0.00	0.00
11	0.03719	1.58E 03	1.57E 03	1.57E 03	1.57E 03	1.58E 03	1.58E 03	1.58E 03	1.58E 03	1.58E 03	1.59E 03	0.00	0.00
10	0.03437	1.50E 03	1.51E 03	1.51E 03	1.52E 03	1.52E 03	1.53E 03	1.53E 03	1.54E 03	1.54E 03	1.55E 03	0.00	0.00
9	0.03219	1.45E 03	1.46E 03	1.47E 03	1.47E 03	1.48E 03	1.49E 03	1.49E 03	1.50E 03	1.51E 03	1.51E 03	0.00	0.00
8	0.03031	1.40E 03	1.42E 03	1.43E 03	1.44E 03	1.45E 03	1.46E 03	1.47E 03	1.47E 03	1.48E 03	1.49E 03	0.00	0.00
7	0.02687	1.33E 03	1.35E 03	1.36E 03	1.38E 03	1.39E 03	1.40E 03	1.42E 03	1.43E 03	1.44E 03	1.45E 03	0.00	0.00
6	0.02187	1.22E 03	1.25E 03	1.28E 03	1.30E 03	1.32E 03	1.34E 03	1.35E 03	1.37E 03	1.38E 03	1.39E 03	0.00	0.00
5	0.01625	1.12E 03	1.16E 03	1.20E 03	1.23E 03	1.26E 03	1.28E 03	1.30E 03	1.31E 03	1.33E 03	1.35E 03	0.00	0.00
4	0.01062	1.05E 03	1.10E 03	1.14E 03	1.18E 03	1.21E 03	1.23E 03	1.26E 03	1.28E 03	1.29E 03	1.31E 03	0.00	0.00
3	0.00562	1.00E 03	1.06E 03	1.11E 03	1.15E 03	1.18E 03	1.21E 03	1.24E 03	1.26E 03	1.28E 03	1.29E 03	0.00	0.00
2	0.00156	9.88E 02	1.05E 03	1.10E 03	1.14E 03	1.17E 03	1.20E 03	1.23E 03	1.25E 03	1.27E 03	1.29E 03	0.00	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	5.83E-02	4.84E-02	7.73E-02	8.34E-02	8.16E-02	8.37E-02	9.05E-02	9.82E-02
19	0.05937	0.00	0.00	0.00	0.00	6.33E-02	4.87E-02	7.58E-02	8.04E-02	7.73E-02	7.66E-02	7.99E-02	8.46E-02
18	0.05594	0.00	0.00	0.00	0.00	7.78E-02	5.15E-02	7.46E-02	7.58E-02	7.02E-02	6.63E-02	6.47E-02	6.55E-02
17	0.05344	0.00	0.00	0.00	1.20E-02	7.00E-02	5.94E-02	7.46E-02	7.24E-02	6.46E-02	5.78E-02	5.35E-02	5.13E-02
16	0.05078	0.00	0.00	0.00	3.14E-02	5.78E-02	6.58E-02	7.41E-02	6.76E-02	5.75E-02	4.81E-02	4.12E-02	3.62E-02
15	0.04812	0.00	0.00	0.00	5.41E-02	5.33E-02	6.80E-02	7.07E-02	6.15E-02	4.83E-02	3.72E-02	2.82E-02	2.11E-02
14	0.04562	0.00	0.00	-6.77E-02	4.11E-02	5.15E-02	6.58E-02	6.46E-02	5.31E-02	3.79E-02	2.56E-02	1.51E-02	6.54E-03
13	0.04328	0.00	0.00	-4.99E-02	1.58E-02	4.67E-02	5.91E-02	5.52E-02	4.25E-02	2.66E-02	1.35E-02	2.32E-03	-7.21E-03

[illegible]

1.22229	1.46130	1.66130	1.92378	2.19793	2.49832	2.83263	3.18718	3.56130	3.95383	4.17013
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[illegible]

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363

11	1.00000	0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	0.00	2.37E-01	3.12E-01	3.75E-01	4.37E-01	4.78E-01	4.87E-01	4.87E-01	4.86E-01	4.85E-01	4.84E-01	4.83E-01
9	0.80000	0.00	2.23E-01	2.92E-01	3.59E-01	4.19E-01	4.64E-01	4.74E-01	4.75E-01	4.73E-01	4.71E-01	4.68E-01	4.66E-01
8	0.70000	0.00	2.09E-01	2.81E-01	3.51E-01	4.09E-01	4.50E-01	4.63E-01	4.63E-01	4.60E-01	4.56E-01	4.52E-01	4.49E-01
7	0.60000	0.00	1.93E-01	2.67E-01	3.41E-01	3.99E-01	4.38E-01	4.51E-01	4.51E-01	4.47E-01	4.42E-01	4.36E-01	4.31E-01
6	0.50000	0.00	1.77E-01	2.49E-01	3.29E-01	3.88E-01	4.28E-01	4.41E-01	4.40E-01	4.34E-01	4.27E-01	4.19E-01	4.12E-01
5	0.40000	0.00	1.57E-01	2.31E-01	3.17E-01	3.78E-01	4.17E-01	4.30E-01	4.28E-01	4.21E-01	4.11E-01	4.01E-01	3.92E-01
4	0.30000	0.00	1.36E-01	2.11E-01	3.04E-01	3.67E-01	4.07E-01	4.19E-01	4.16E-01	4.06E-01	3.93E-01	3.81E-01	3.69E-01
3	0.20000	0.00	1.10E-01	1.88E-01	2.90E-01	3.56E-01	3.96E-01	4.08E-01	4.04E-01	3.90E-01	3.74E-01	3.58E-01	3.43E-01
2	0.10000	0.00	7.75E-02	1.59E-01	2.74E-01	3.45E-01	3.85E-01	3.96E-01	3.89E-01	3.71E-01	3.50E-01	3.29E-01	3.08E-01
1	0.00000	0.00	0.00	1.13E-01	2.51E-01	3.31E-01	3.72E-01	3.84E-01	3.72E-01	3.48E-01	3.18E-01	2.89E-01	2.56E-01

[illegible]

[illegible]

I	13	14	15	16	17	18	19	20	21	22	23	
3 0.00562	4.49E 05	1.55E 05	3.68E 04	1.01E 04	8.06E 03	7.96E 03	8.43E 03	8.98E 03	9.25E 03	8.97E 03	8.04E 03	6.61E 03
2 0.00156	4.49E 05	1.87E 05	2.68E 04	8.77E 03	7.63E 03	7.59E 03	8.03E 03	8.52E 03	8.76E 03	8.50E 03	7.64E 03	6.32E 03
1-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 I =	13	14	15	16	17	18	19	20	21	22	23	
X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127	
0 J Y												
21 0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 0.06187	6.25E 03	5.60E 03	4.87E 03	4.22E 03	3.70E 03	3.29E 03	2.97E 03	2.72E 03	2.52E 03	2.52E 03	4.49E 05	
19 0.05937	5.66E 03	4.82E 03	3.95E 03	3.21E 03	2.62E 03	2.16E 03	1.83E 03	1.59E 03	1.42E 03	1.61E 03	4.49E 05	
18 0.05594	5.79E 03	4.65E 03	3.62E 03	2.78E 03	2.15E 03	1.68E 03	1.34E 03	1.11E 03	9.53E 02	1.21E 03	4.49E 05	
17 0.05344	6.09E 03	4.72E 03	3.56E 03	2.66E 03	2.00E 03	1.52E 03	1.19E 03	9.63E 02	8.09E 02	1.10E 03	4.49E 05	
16 0.05078	6.50E 03	4.88E 03	3.59E 03	2.62E 03	1.93E 03	1.44E 03	1.11E 03	8.84E 02	7.34E 02	1.05E 03	4.49E 05	
15 0.04812	6.91E 03	5.06E 03	3.65E 03	2.62E 03	1.90E 03	1.40E 03	1.06E 03	8.41E 02	6.93E 02	1.03E 03	4.49E 05	
14 0.04562	7.25E 03	5.23E 03	3.71E 03	2.63E 03	1.89E 03	1.37E 03	1.03E 03	8.15E 02	6.69E 02	1.01E 03	4.49E 05	
13 0.04328	7.52E 03	5.35E 03	3.76E 03	2.64E 03	1.88E 03	1.36E 03	1.02E 03	7.98E 02	6.53E 02	9.94E 02	4.49E 05	
12 0.04094	7.71E 03	5.45E 03	3.80E 03	2.65E 03	1.87E 03	1.34E 03	1.00E 03	7.83E 02	6.39E 02	9.75E 02	4.49E 05	
11 0.03719	7.86E 03	5.52E 03	3.81E 03	2.64E 03	1.85E 03	1.32E 03	9.77E 02	7.60E 02	6.19E 02	9.36E 02	4.49E 05	
10 0.03437	7.84E 03	5.49E 03	3.79E 03	2.61E 03	1.82E 03	1.29E 03	9.55E 02	7.41E 02	6.01E 02	9.00E 02	4.49E 05	
9 0.03219	7.75E 03	5.43E 03	3.74E 03	2.57E 03	1.79E 03	1.27E 03	9.34E 02	7.23E 02	5.86E 02	8.68E 02	4.49E 05	
8 0.03031	7.64E 03	5.35E 03	3.68E 03	2.53E 03	1.76E 03	1.24E 03	9.15E 02	7.07E 02	5.72E 02	8.38E 02	4.49E 05	
7 0.02687	7.35E 03	5.16E 03	3.55E 03	2.44E 03	1.69E 03	1.19E 03	8.76E 02	6.76E 02	5.45E 02	7.81E 02	4.49E 05	
6 0.02187	6.80E 03	4.81E 03	3.31E 03	2.28E 03	1.58E 03	1.11E 03	8.15E 02	6.27E 02	5.05E 02	6.96E 02	4.49E 05	
5 0.01625	6.11E 03	4.37E 03	3.03E 03	2.08E 03	1.45E 03	1.02E 03	7.48E 02	5.74E 02	4.61E 02	6.08E 02	4.49E 05	
4 0.01062	5.48E 03	3.97E 03	2.78E 03	1.92E 03	1.34E 03	9.46E 02	6.93E 02	5.32E 02	4.26E 02	5.38E 02	4.49E 05	
3 0.00562	5.09E 03	3.71E 03	2.62E 03	1.83E 03	1.27E 03	9.02E 02	6.63E 02	5.09E 02	4.08E 02	4.99E 02	4.49E 05	
2 0.00156	4.89E 03	3.60E 03	2.56E 03	1.79E 03	1.25E 03	8.91E 02	6.57E 02	5.06E 02	4.06E 02	4.86E 02	4.49E 05	
1-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DIMENSIONLESS STREAM FUNCTION

I	1	2	3	4	5	6	7	8	9	10	11	12
0 I =	1	2	3	4	5	6	7	8	9	10	11	12
X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0 J Y												
21 0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 0.06187	0.00	0.00	0.00	0.00	0.00	0.00	9.82E-01	9.65E-01	9.63E-01	9.66E-01	9.69E-01	9.71E-01
19 0.05937	0.00	0.00	0.00	0.00	0.00	0.00	8.80E-01	8.07E-01	8.00E-01	8.13E-01	8.28E-01	8.41E-01
18 0.05594	0.00	0.00	0.00	0.00	0.00	0.00	6.83E-01	5.65E-01	5.62E-01	5.96E-01	6.34E-01	6.65E-01
17 0.05344	0.00	0.00	0.00	0.00	0.00	8.96E-01	5.05E-01	3.78E-01	3.89E-01	4.43E-01	4.98E-01	5.44E-01
16 0.05078	0.00	0.00	0.00	0.00	0.00	6.84E-01	3.09E-01	1.88E-01	2.18E-01	2.94E-01	3.67E-01	4.25E-01
15 0.04812	0.00	0.00	0.00	0.00	0.00	4.94E-01	1.27E-01	2.33E-02	7.34E-02	1.67E-01	2.52E-01	3.18E-01
14 0.04562	0.00	0.00	0.00	8.80E-01	3.14E-01	-2.59E-02	-1.02E-01	-3.35E-02	6.91E-02	1.59E-01	2.30E-01	2.86E-01
13 0.04328	0.00	0.00	0.00	6.78E-01	1.59E-01	-1.40E-01	-1.87E-01	-1.07E-01	-3.11E-03	8.72E-02	1.59E-01	2.17E-01
12 0.04094	0.00	0.00	0.00	5.23E-01	3.24E-02	-2.21E-01	-2.41E-01	-1.58E-01	-5.85E-02	2.81E-02	9.86E-02	1.57E-01
11 0.03719	0.00	0.00	8.65E-01	3.08E-01	-1.24E-01	-2.90E-01	-2.78E-01	-2.03E-01	-1.18E-01	-4.15E-02	2.35E-02	7.95E-02
10 0.03437	0.00	0.00	6.90E-01	1.73E-01	-1.98E-01	-2.98E-01	-2.76E-01	-2.13E-01	-1.42E-01	-7.55E-02	-1.65E-02	3.61E-02
9 0.03219	0.00	0.00	5.89E-01	9.10E-02	-2.26E-01	-2.86E-01	-2.63E-01	-2.11E-01	-1.50E-01	-9.25E-02	-3.88E-02	1.03E-02
8 0.03031	0.00	9.41E-01	5.06E-01	3.26E-02	-2.34E-01	-2.69E-01	-2.47E-01	-2.04E-01	-1.52E-01	-1.01E-01	-5.24E-02	-6.78E-03
7 0.02687	0.00	7.40E-01	3.60E-01	-4.99E-02	-2.25E-01	-2.30E-01	-2.11E-01	-1.82E-01	-1.45E-01	-1.06E-01	-6.60E-02	-2.74E-02
6 0.02187	0.00	4.90E-01	1.82E-01	-1.16E-01	-1.77E-01	-1.67E-01	-1.54E-01	-1.38E-01	-1.18E-01	-9.30E-02	-6.56E-02	-3.78E-02
5 0.01625	0.00	2.70E-01	4.40E-02	-1.13E-01	-1.10E-01	-9.96E-02	-9.22E-02	-8.53E-02	-7.59E-02	-6.31E-02	-4.77E-02	-3.12E-02
4 0.01062	0.00	1.16E-01	-1.80E-02	-6.07E-02	-5.13E-02	-4.53E-02	-4.18E-02	-3.92E-02	-3.58E-02	-3.07E-02	-2.41E-02	-1.67E-02
3 0.00562	0.00	3.24E-02	-1.65E-02	-1.76E-02	-1.51E-02	-1.32E-02	-1.21E-02	-1.14E-02	-1.06E-02	-9.21E-03	-7.36E-03	-5.25E-03
2 0.00156	0.00	2.50E-03	-1.95E-03	-1.42E-03	-1.19E-03	-1.04E-03	-9.51E-04	-8.99E-04	-8.35E-04	-7.32E-04	-5.90E-04	-4.26E-04
1-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

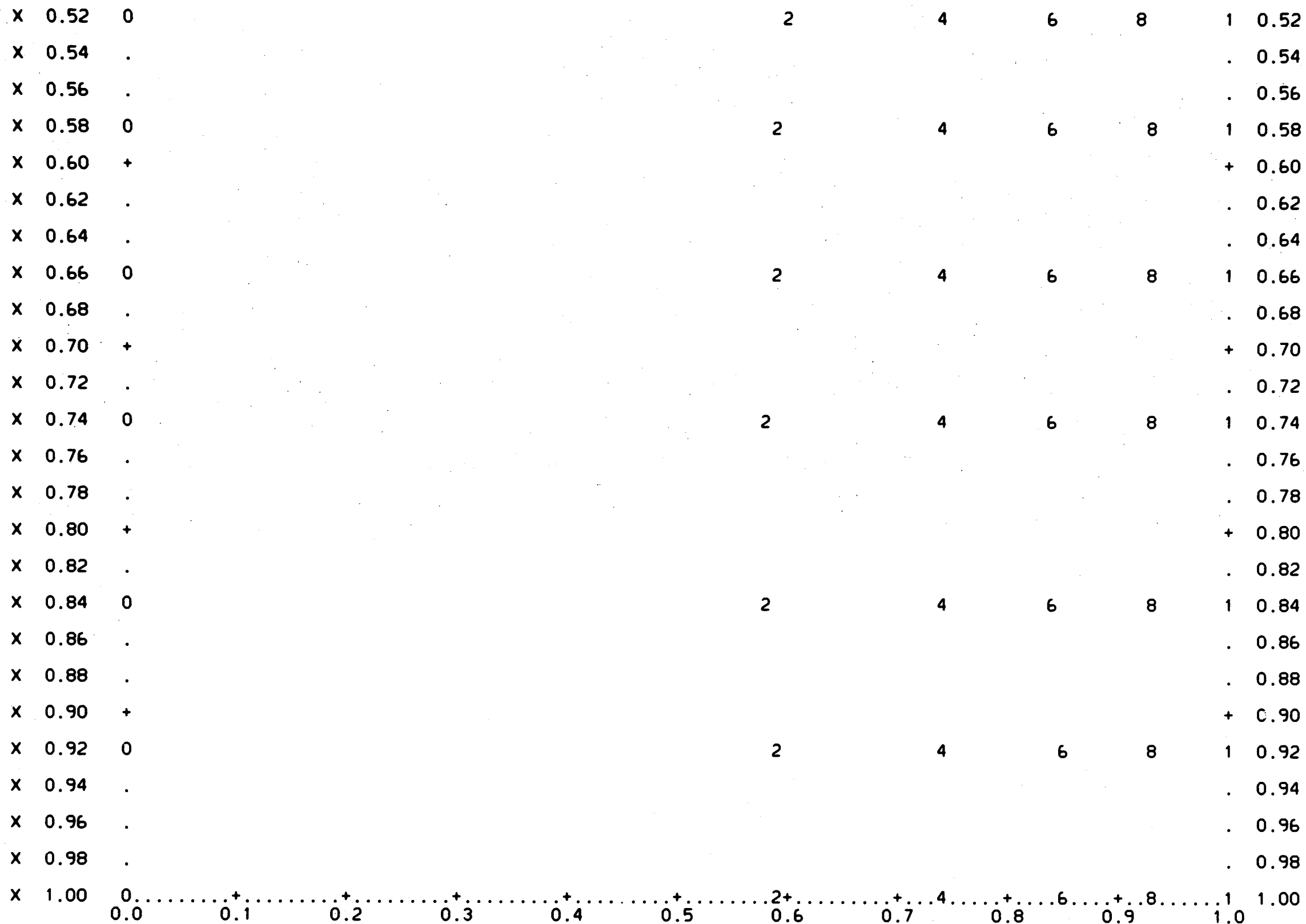
I	13	14	15	16	17	18	19	20	21	22	23	
0 I =	13	14	15	16	17	18	19	20	21	22	23	
X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037	

0*-**--**--**--**--**--**--**--**--**--*													
DIMENSIONLESS LENGTH SCALE													
-**-**--**--**--**--**--**--**--**--**--*													
0	I =	2	3	4	5	6	7	8	9	10	11	12	13
0 J	X =	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552	0.15786
Y													
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	2.14E-01	2.13E-01	2.15E-01	2.39E-01	2.94E-01	3.33E-01	3.41E-01	3.30E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	2.01E-01	2.13E-01	2.37E-01	3.07E-01	4.21E-01	5.11E-01	5.52E-01	5.57E-01
17	0.05344	0.00	0.00	5.10E-02	1.42E-01	1.80E-01	2.13E-01	2.61E-01	3.56E-01	4.79E-01	5.80E-01	6.39E-01	6.60E-01
16	0.05078	0.00	0.00	1.78E-01	1.84E-01	2.05E-01	2.39E-01	3.07E-01	4.11E-01	5.27E-01	6.30E-01	7.02E-01	7.38E-01
15	0.04812	0.00	0.00	1.78E-01	1.79E-01	2.17E-01	2.75E-01	3.59E-01	4.60E-01	5.68E-01	6.69E-01	7.48E-01	7.95E-01
14	0.04562	0.00	5.10E-02	1.16E-01	1.71E-01	2.42E-01	3.20E-01	4.06E-01	5.01E-01	6.03E-01	7.02E-01	7.84E-01	8.38E-01
13	0.04328	0.00	1.60E-01	1.47E-01	2.01E-01	2.84E-01	3.65E-01	4.46E-01	5.36E-01	6.34E-01	7.31E-01	8.14E-01	8.73E-01
12	0.04094	0.00	1.60E-01	1.38E-01	2.20E-01	3.26E-01	4.07E-01	4.84E-01	5.70E-01	6.65E-01	7.60E-01	8.43E-01	9.04E-01
11	0.03719	7.64E-02	7.35E-02	1.23E-01	2.57E-01	4.03E-01	4.71E-01	5.41E-01	6.23E-01	7.14E-01	8.06E-01	8.88E-01	9.51E-01
10	0.03437	1.60E-01	6.76E-02	1.38E-01	3.19E-01	4.57E-01	5.16E-01	5.81E-01	6.62E-01	7.50E-01	8.40E-01	9.20E-01	9.84E-01
9	0.03219	1.60E-01	4.18E-02	1.51E-01	3.69E-01	4.99E-01	5.50E-01	6.14E-01	6.92E-01	7.78E-01	8.66E-01	9.45E-01	1.01E 00
8	0.03031	5.39E-03	3.04E-02	1.70E-01	4.12E-01	5.34E-01	5.82E-01	6.43E-01	7.19E-01	8.03E-01	8.88E-01	9.67E-01	1.03E 00
7	0.02687	5.46E-03	4.01E-02	2.08E-01	5.01E-01	5.98E-01	6.41E-01	6.97E-01	7.69E-01	8.49E-01	9.29E-01	1.01E 00	1.07E 00
6	0.02187	5.70E-03	6.14E-02	2.99E-01	6.12E-01	6.88E-01	7.26E-01	7.78E-01	8.43E-01	9.15E-01	9.89E-01	1.06E 00	1.12E 00
5	0.01625	6.47E-03	1.07E-01	4.47E-01	7.26E-01	7.84E-01	8.20E-01	8.66E-01	9.23E-01	9.88E-01	1.06E 00	1.12E 00	1.18E 00
4	0.01062	9.04E-03	1.92E-01	6.04E-01	8.22E-01	8.69E-01	9.04E-01	9.47E-01	9.98E-01	1.06E 00	1.12E 00	1.18E 00	1.23E 00
3	0.00562	1.84E-02	3.18E-01	7.34E-01	8.89E-01	9.28E-01	9.64E-01	1.01E 00	1.05E 00	1.11E 00	1.17E 00	1.22E 00	1.28E 00
2	0.00156	2.81E-02	4.47E-01	8.30E-01	9.34E-01	9.70E-01	1.01E 00	1.05E 00	1.10E 00	1.15E 00	1.21E 00	1.26E 00	1.31E 00
0	I =	14	15	16	17	18	19	20	21	22	23		
0 J	X =	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127		

51	0.1516E	00	0.1027E	00	0.5831E-01	0.2881E-01	0.3543E-01	0.6465E	09	0.5422E	01-0.6124E-03	0.1704E	02	0.1984E	04	0.2551E	04
52	0.1497E	00	0.1012E	00	0.5815E-01	0.2949E-01	0.3514E-01	0.6165E	09	0.5421E	01-0.6824E-03	0.1704E	02	0.1984E	04	0.2553E	04
53	0.1477E	00	0.1000E	00	0.5792E-01	0.3019E-01	0.3478E-01	0.5809E	09	0.5420E	01-0.7587E-03	0.1705E	02	0.1984E	04	0.2555E	04
54	0.1458E	00	0.9891E-01	0.5761E-01	0.3093E-01	0.3439E-01	0.5420E	09	0.5419E	01-0.8406E-03	0.1705E	02	0.1984E	04	0.2557E	04	
55	0.1439E	00	0.9796E-01	0.5734E-01	0.3161E-01	0.3394E-01	0.5007E	09	0.5418E	01-0.9289E-03	0.1706E	02	0.1984E	04	0.2559E	04	
56	0.1422E	00	0.9753E-01	0.5705E-01	0.3235E-01	0.3345E-01	0.4580E	09	0.5417E	01-0.1023E-02	0.1706E	02	0.1984E	04	0.2561E	04	
57	0.1404E	00	0.9699E-01	0.5686E-01	0.3312E-01	0.3293E-01	0.4154E	09	0.5416E	01-0.1122E-02	0.1707E	02	0.1984E	04	0.2563E	04	
58	0.1392E	00	0.9644E-01	0.5670E-01	0.3381E-01	0.3239E-01	0.3754E	09	0.5414E	01-0.1228E-02	0.1708E	02	0.1984E	04	0.2565E	04	
59	0.1382E	00	0.9604E-01	0.5647E-01	0.3449E-01	0.3187E-01	0.3516E	09	0.5413E	01-0.1339E-02	0.1708E	02	0.1984E	04	0.2568E	04	
60	0.1371E	00	0.9563E-01	0.5617E-01	0.3520E-01	0.3134E-01	0.3342E	09	0.5411E	01-0.1455E-02	0.1709E	02	0.1984E	04	0.2571E	04	
61	0.1359E	00	0.9526E-01	0.5578E-01	0.3589E-01	0.3079E-01	0.3192E	09	0.5409E	01-0.1578E-02	0.1709E	02	0.1984E	04	0.2573E	04	
62	0.1347E	00	0.9501E-01	0.5534E-01	0.3654E-01	0.3022E-01	0.3037E	09	0.5407E	01-0.1705E-02	0.1710E	02	0.1985E	04	0.2576E	04	
63	0.1333E	00	0.9492E-01	0.5490E-01	0.3725E-01	0.2962E-01	0.2864E	09	0.5405E	01-0.1836E-02	0.1711E	02	0.1985E	04	0.2579E	04	
64	0.1321E	00	0.9505E-01	0.5451E-01	0.3790E-01	0.2900E-01	0.2691E	09	0.5403E	01-0.1972E-02	0.1711E	02	0.1985E	04	0.2583E	04	
65	0.1312E	00	0.9485E-01	0.5424E-01	0.3852E-01	0.2837E-01	0.2515E	09	0.5400E	01-0.2111E-02	0.1712E	02	0.1985E	04	0.2586E	04	
66	0.1303E	00	0.9462E-01	0.5392E-01	0.3909E-01	0.2773E-01	0.2357E	09	0.5398E	01-0.2255E-02	0.1712E	02	0.1985E	04	0.2590E	04	
67	0.1293E	00	0.9446E-01	0.5353E-01	0.3970E-01	0.2708E-01	0.2280E	09	0.5395E	01-0.2402E-02	0.1713E	02	0.1986E	04	0.2594E	04	
68	0.1280E	00	0.9423E-01	0.5306E-01	0.4023E-01	0.2642E-01	0.2192E	09	0.5391E	01-0.2552E-02	0.1714E	02	0.1986E	04	0.2598E	04	
69	0.1268E	00	0.9385E-01	0.5255E-01	0.4072E-01	0.2576E-01	0.2144E	09	0.5388E	01-0.2705E-02	0.1715E	02	0.1986E	04	0.2602E	04	
70	0.1255E	00	0.9351E-01	0.5199E-01	0.4115E-01	0.2511E-01	0.2137E	09	0.5384E	01-0.2859E-02	0.1715E	02	0.1987E	04	0.2606E	04	
71	0.1244E	00	0.9325E-01	0.5135E-01	0.4155E-01	0.2445E-01	0.2122E	09	0.5381E	01-0.3015E-02	0.1716E	02	0.1987E	04	0.2611E	04	
72	0.1234E	00	0.9351E-01	0.5072E-01	0.4190E-01	0.2378E-01	0.2101E	09	0.5376E	01-0.3173E-02	0.1717E	02	0.1988E	04	0.2616E	04	
73	0.1226E	00	0.9367E-01	0.5019E-01	0.4223E-01	0.2310E-01	0.2077E	09	0.5372E	01-0.3330E-02	0.1718E	02	0.1988E	04	0.2621E	04	
74	0.1216E	00	0.9356E-01	0.4970E-01	0.4250E-01	0.2243E-01	0.2038E	09	0.5368E	01-0.3486E-02	0.1718E	02	0.1989E	04	0.2626E	04	
75	0.1206E	00	0.9326E-01	0.4913E-01	0.4274E-01	0.2177E-01	0.1985E	09	0.5363E	01-0.3642E-02	0.1719E	02	0.1989E	04	0.2631E	04	
76	0.1194E	00	0.9279E-01	0.4850E-01	0.4289E-01	0.2110E-01	0.1934E	09	0.5358E	01-0.3796E-02	0.1720E	02	0.1990E	04	0.2637E	04	
77	0.1181E	00	0.9218E-01	0.4783E-01	0.4300E-01	0.2044E-01	0.1860E	09	0.5352E	01-0.3948E-02	0.1721E	02	0.1990E	04	0.2643E	04	
78	0.1168E	00	0.9134E-01	0.4716E-01	0.4302E-01	0.1978E-01	0.1795E	09	0.5347E	01-0.4096E-02	0.1722E	02	0.1991E	04	0.2649E	04	
79	0.1159E	00	0.9043E-01	0.4645E-01	0.4304E-01	0.1914E-01	0.1716E	09	0.5341E	01-0.4241E-02	0.1723E	02	0.1992E	04	0.2655E	04	
80	0.1149E	00	0.8946E-01	0.4568E-01	0.4297E-01	0.1850E-01	0.1643E	09	0.5335E	01-0.4381E-02	0.1724E	02	0.1992E	04	0.2661E	04	
81	0.1138E	00	0.8866E-01	0.4489E-01	0.4282E-01	0.1788E-01	0.1574E	09	0.5329E	01-0.4515E-02	0.1725E	02	0.1993E	04	0.2668E	04	
82	0.1128E	00	0.8826E-01	0.4409E-01	0.4269E-01	0.1728E-01	0.1499E	09	0.5323E	01-0.4644E-02	0.1726E	02	0.1994E	04	0.2674E	04	
83	0.1117E	00	0.8772E-01	0.4339E-01	0.4247E-01	0.1671E-01	0.1431E	09	0.5316E	01-0.4766E-02	0.1727E	02	0.1994E	04	0.2681E	04	
84	0.1105E	00	0.8704E-01	0.4265E-01	0.4218E-01	0.1614E-01	0.1366E	09	0.5309E	01-0.4881E-02	0.1728E	02	0.1995E	04	0.2688E	04	
85	0.1092E	00	0.8617E-01	0.4190E-01	0.4188E-01	0.1565E-01	0.1301E	09	0.5302E	01-0.4987E-02	0.1729E	02	0.1996E	04	0.2695E	04	
86	0.1079E	00	0.8517E-01	0.4113E-01	0.4151E-01	0.1518E-01	0.1236E	09	0.5295E	01-0.5086E-02	0.1730E	02	0.1997E	04	0.2703E	04	
87	0.1069E	00	0.8399E-01	0.4034E-01	0.4104E-01	0.1473E-01	0.1188E	09	0.5287E	01-0.5174E-02	0.1731E	02	0.1997E	04	0.2710E	04	
88	0.1058E	00	0.8264E-01	0.3951E-01	0.4059E-01	0.1428E-01	0.1139E	09	0.5279E	01-0.5253E-02	0.1732E	02	0.1998E	04	0.2718E	04	
89	0.1047E	00	0.8116E-01	0.3864E-01	0.4010E-01	0.1385E-01	0.1092E	09	0.5272E	01-0.5322E-02	0.1733E	02	0.1999E	04	0.2725E	04	
90	0.1035E	00	0.7961E-01	0.3776E-01	0.3957E-01	0.1350E-01	0.1053E	09	0.5264E	01-0.5379E-02	0.1734E	02	0.2000E	04	0.2733E	04	
91	0.1023E	00	0.7800E-01	0.3690E-01	0.3891E-01	0.1318E-01	0.1023E	09	0.5256E	01-0.5426E-02	0.1736E	02	0.2001E	04	0.2741E	04	
92	0.1010E	00	0.7663E-01	0.3607E-01	0.3832E-01	0.1287E-01	0.1011E	09	0.5247E	01-0.5460E-02	0.1737E	02	0.2002E	04	0.2749E	04	
93	0.9974E-01	0.7542E-01	0.3527E-01	0.3763E-01	0.1258E-01	0.9976E	08	0.5239E	01-0.5483E-02	0.1738E	02	0.2002E	04	0.2757E	04		
94	0.9840E-01	0.7420E-01	0.3448E-01	0.3715E-01	0.1229E-01	0.1021E	09	0.5229E	01-0.6280E-02	0.1739E	02	0.2003E	04	0.2765E	04		
95	0.9421E-01	0.8104E-01	0.3365E-01	0.3652E-01	0.1200E-01	0.1053E	09	0.5219E	01-0.6507E-02	0.1741E	02	0.2004E	04	0.2773E	04		
96	0.9381E-01	0.7819E-01	0.3279E-01	0.3556E-01	0.1175E-01	0.1050E	09	0.5210E	01-0.5773E-02	0.1742E	02	0.2005E	04	0.2781E	04		
97	0.9462E-01	0.6982E-01	0.3194E-01	0.3484E-01	0.1158E-01	0.1045E	09	0.5199E	01-0.6281E-02	0.1743E	02	0.2006E	04	0.2789E	04		
98	0.8954E-01	0.7566E-01	0.3107E-01	0.3417E-01	0.1142E-01	0.1035E	09	0.5189E	01-0.6342E-02	0.1744E	02	0.2007E	04	0.2798E	04		
99	0.8949E-01	0.7191E-01	0.3019E-01	0.3314E-01	0.1125E-01	0.1050E	09	0.5178E	01-0.6329E-02	0.1746E	02	0.2008E	04	0.2806E	04		
100	0.8720E-01	0.7032E-01	0.2935E-01	0.3232E-01	0.1106E-01	0.1069E	09	0.5168E	01-0.6213E-02	0.1747E	02	0.2009E	04	0.2814E	04		
101	0.8572E-01	0.6801E-01	0.2855E-01	0.3140E-01	0.1083E-01	0.1086E	09	0.5157E	01-0.6082E-02	0.1748E	02	0.2010E	04	0.2823E	04		
102	0.8407E-01	0.6552E-01	0.2775E-01	0.3056E-01	0.1060E-01	0.1101E	09	0.5147E	01-0.5922E-02	0.1750E	02	0.2011E	04	0.2831E	04		
103	0.8255E-01	0.6322E-01	0.2696E-01	0.2962E-01	0.1041E-01	0.1120E	09	0.5137E	01-0.5752E-02	0.1751E	02	0.2012E	04	0.2839E	04		
104	0.8092E-01	0.6113E-01	0.2620E-01	0.2874E-01	0.1029E-01	0.1136E	09	0.5127E	01-0.5568E-02	0.1752E	02	0.2013E	04	0.2847E	04		

12	0.04094	0.00	0.00	-2.38E-02	2.02E-03	3.72E-02	4.81E-02	4.22E-02	2.91E-02	1.32E-02	1.68E-04	-1.13E-02	-2.12E-02
11	0.03719	0.00	-1.15E-01	-3.83E-02	-1.46E-02	1.32E-02	2.04E-02	1.61E-02	2.95E-03	-1.08E-02	-2.29E-02	-3.36E-02	-4.35E-02
10	0.03437	0.00	-1.07E-01	-6.40E-02	-3.18E-02	-8.54E-03	-4.46E-03	-7.80E-03	-1.98E-02	-3.16E-02	-4.19E-02	-5.16E-02	-6.06E-02
9	0.03219	0.00	-1.02E-01	-7.41E-02	-4.60E-02	-3.22E-02	-2.61E-02	-2.85E-02	-3.93E-02	-4.90E-02	-5.81E-02	-6.66E-02	-7.40E-02
8	0.03031	0.00	-1.05E-01	-9.12E-02	-6.51E-02	-5.11E-02	-4.50E-02	-4.74E-02	-5.64E-02	-6.44E-02	-7.22E-02	-7.93E-02	-8.57E-02
7	0.02687	0.00	-1.26E-01	-1.21E-01	-9.67E-02	-8.73E-02	-8.23E-02	-8.37E-02	-8.85E-02	-9.37E-02	-9.74E-02	-1.01E-01	-1.06E-01
6	0.02187	0.00	-1.69E-01	-1.65E-01	-1.55E-01	-1.41E-01	-1.36E-01	-1.35E-01	-1.35E-01	-1.33E-01	-1.32E-01	-1.31E-01	-1.33E-01
5	0.01525	0.00	-2.10E-01	-2.20E-01	-2.03E-01	-1.98E-01	-1.92E-01	-1.86E-01	-1.80E-01	-1.73E-01	-1.66E-01	-1.60E-01	-1.59E-01
4	0.01062	0.00	-2.52E-01	-2.63E-01	-2.55E-01	-2.46E-01	-2.36E-01	-2.24E-01	-2.15E-01	-2.03E-01	-1.92E-01	-1.82E-01	-1.78E-01
3	0.00562	0.00	-2.83E-01	-2.90E-01	-2.87E-01	-2.76E-01	-2.61E-01	-2.47E-01	-2.34E-01	-2.21E-01	-2.07E-01	-1.95E-01	-1.89E-01
2	0.00156	0.00	-3.02E-01	-3.01E-01	-2.99E-01	-2.87E-01	-2.70E-01	-2.55E-01	-2.41E-01	-2.27E-01	-2.13E-01	-2.00E-01	-1.93E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127	
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.03E-01	1.08E-01	1.14E-01	1.23E-01	1.32E-01	1.40E-01	1.44E-01	1.45E-01	1.45E-01	1.44E-01	1.44E-01	0.00
19	0.05937	8.79E-02	9.16E-02	9.76E-02	1.06E-01	1.16E-01	1.23E-01	1.28E-01	1.30E-01	1.30E-01	1.28E-01	1.28E-01	0.00
18	0.05594	6.58E-02	6.82E-02	7.29E-02	8.11E-02	8.92E-02	9.55E-02	9.98E-02	1.01E-01	1.01E-01	9.86E-02	9.86E-02	0.00
17	0.05344	4.96E-02	5.10E-02	5.48E-02	6.20E-02	6.86E-02	7.38E-02	7.71E-02	7.76E-02	7.71E-02	7.41E-02	7.41E-02	0.00
16	0.05078	3.26E-02	3.28E-02	3.57E-02	4.13E-02	4.65E-02	5.00E-02	5.20E-02	5.18E-02	5.05E-02	4.70E-02	4.70E-02	0.00
15	0.04812	1.54E-02	1.50E-02	1.67E-02	2.07E-02	2.40E-02	2.58E-02	2.61E-02	2.54E-02	2.35E-02	1.96E-02	1.96E-02	0.00
14	0.04562	-3.54E-04	-2.09E-03	-1.26E-03	1.02E-03	2.91E-03	2.91E-03	1.77E-03	5.98E-04	-1.89E-03	-5.96E-03	-5.96E-03	0.00
13	0.04328	-1.51E-02	-1.77E-02	-1.78E-02	-1.69E-02	-1.68E-02	-1.84E-02	-2.08E-02	-2.26E-02	-2.54E-02	-2.95E-02	-2.95E-02	0.00
12	0.04094	-2.97E-02	-3.30E-02	-3.41E-02	-3.47E-02	-3.63E-02	-3.97E-02	-4.31E-02	-4.56E-02	-4.85E-02	-5.23E-02	-5.23E-02	0.00
11	0.03719	-5.24E-02											

DIMENSIONLESS PRESSURE												
I =	1	2	3	4	5	6	7	8	9	10	11	12
X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
J	Y											
10	0.90000	4.82E-01	4.81E-01	4.81E-01	4.81E-01	4.81E-01	4.82E-01	4.82E-01	4.82E-01	4.82E-01	4.82E-01	4.82E-01
9	0.80000	4.64E-01	4.63E-01	4.62E-01	4.62E-01	4.62E-01	4.63E-01	4.63E-01	4.63E-01	4.63E-01	4.64E-01	4.64E-01
8	0.70000	4.46E-01	4.44E-01	4.43E-01	4.42E-01	4.42E-01	4.43E-01	4.43E-01	4.43E-01	4.44E-01	4.44E-01	4.44E-01
7	0.60000	4.27E-01	4.24E-01	4.22E-01	4.21E-01	4.21E-01	4.21E-01	4.21E-01	4.22E-01	4.22E-01	4.23E-01	4.23E-01
6	0.50000	4.06E-01	4.02E-01	3.99E-01	3.97E-01	3.97E-01	3.97E-01	3.97E-01	3.97E-01	3.98E-01	3.98E-01	3.98E-01
5	0.40000	3.84E-01	3.78E-01	3.74E-01	3.71E-01	3.70E-01	3.69E-01	3.69E-01	3.69E-01	3.69E-01	3.70E-01	3.70E-01
4	0.30000	3.59E-01	3.50E-01	3.45E-01	3.40E-01	3.38E-01	3.36E-01	3.35E-01	3.35E-01	3.36E-01	3.36E-01	3.36E-01
3	0.20000	3.29E-01	3.17E-01	3.08E-01	3.02E-01	2.98E-01	2.95E-01	2.93E-01	2.92E-01	2.92E-01	2.93E-01	2.93E-01
2	0.10000	2.89E-01	2.72E-01	2.58E-01	2.47E-01	2.39E-01	2.34E-01	2.30E-01	2.28E-01	2.28E-01	2.28E-01	2.28E-01
1	0.00000	2.16E-01	1.63E-01	9.14E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y										
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	7.74E 05	7.98E 05	7.79E 05	7.79E 05	7.88E 05	7.98E 05	8.06E 05
19	0.47500	0.00	0.00	0.00	0.00	7.55E 05	7.83E 05	7.66E 05	7.67E 05	7.76E 05	7.84E 05	7.90E 05
18	0.44750	0.00	0.00	0.00	0.00	7.18E 05	7.61E 05	7.45E 05	7.49E 05	7.57E 05	7.63E 05	7.65E 05
17	0.42750	0.00	0.00	0.00	7.44E 05	7.09E 05	7.33E 05	7.25E 05	7.33E 05	7.42E 05	7.45E 05	7.45E 05
16	0.40625	0.00	0.00	0.00	6.86E 05	7.00E 05	7.00E 05	7.02E 05	7.14E 05	7.23E 05	7.25E 05	7.23E 05
15	0.38500	0.00	0.00	0.00	6.08E 05	6.73E 05	6.65E 05	6.76E 05	6.93E 05	7.01E 05	7.02E 05	6.99E 05
14	0.36500	0.00	0.00	8.18E 05	6.06E 05	6.31E 05	6.31E 05	6.50E 05	6.69E 05	6.78E 05	6.78E 05	6.75E 05
13	0.34625	0.00	0.00	7.23E 05	6.17E 05	5.93E 05	5.99E 05	6.25E 05	6.45E 05	6.53E 05	6.54E 05	6.52E 05
12	0.32750	0.00	0.00	5.88E 05	5.97E 05	5.59E 05	5.69E 05	5.98E 05	6.19E 05	6.27E 05	6.29E 05	6.27E 05
11	0.29750	0.00	7.92E 05	5.46E 05	5.28E 05	5.04E 05	5.23E 05	5.52E 05	5.72E 05	5.82E 05	5.86E 05	5.87E 05
10	0.27500	0.00	6.16E 05	5.37E 05	4.82E 05	4.67E 05	4.90E 05	5.15E 05	5.34E 05	5.45E 05	5.52E 05	5.55E 05
9	0.25750	0.00	4.47E 05	4.99E 05	4.48E 05	4.43E 05	4.63E 05	4.86E 05	5.04E 05	5.16E 05	5.25E 05	5.31E 05
8	0.24250	0.00	3.63E 05	4.59E 05	4.26E 05	4.24E 05	4.40E 05	4.60E 05	4.78E 05	4.91E 05	5.02E 05	5.10E 05
7	0.21500	0.00	3.44E 05	4.02E 05	3.82E 05	3.87E 05	3.98E 05	4.13E 05	4.30E 05	4.45E 05	4.60E 05	4.73E 05
6	0.17500	0.00	2.97E 05	3.31E 05	3.27E 05	3.31E 05	3.38E 05	3.49E 05	3.64E 05	3.83E 05	4.03E 05	4.22E 05
5	0.13000	0.00	2.31E 05	2.58E 05	2.65E 05	2.71E 05	2.78E 05	2.87E 05	3.02E 05	3.23E 05	3.48E 05	3.73E 05
4	0.08500	0.00	1.56E 05	1.96E 05	2.10E 05	2.22E 05	2.31E 05	2.41E 05	2.56E 05	2.78E 05	3.06E 05	3.36E 05
3	0.04500	0.00	6.13E 04	1.51E 05	1.75E 05	1.93E 05	2.04E 05	2.15E 05	2.30E 05	2.53E 05	2.83E 05	3.15E 05
2	0.01250	0.00	0.00	1.14E 05	1.60E 05	1.82E 05	1.94E 05	2.05E 05	2.20E 05	2.44E 05	2.74E 05	3.07E 05
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y										
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	8.15E 05	8.15E 05	8.13E 05	8.09E 05	8.04E 05	7.98E 05	7.92E 05	7.85E 05	7.79E 05	7.73E 05	0.00
19	0.47500	7.94E 05	7.93E 05	7.90E 05	7.86E 05	7.82E 05	7.76E 05	7.71E 05	7.65E 05	7.60E 05	7.55E 05	0.00
18	0.44750	7.63E 05	7.60E 05	7.57E 05	7.53E 05	7.49E 05	7.44E 05	7.40E 05	7.35E 05	7.31E 05	7.27E 05	0.00
17	0.42750	7.40E 05	7.37E 05	7.33E 05	7.29E 05	7.25E 05	7.21E 05	7.17E 05	7.13E 05	7.10E 05	7.06E 05	0.00
16	0.40625	7.15E 05	7.11E 05	7.07E 05	7.04E 05	7.00E 05	6.97E 05	6.94E 05	6.91E 05	6.88E 05	6.85E 05	0.00
15	0.38500	6.90E 05	6.86E 05	6.82E 05	6.79E 05	6.76E 05	6.73E 05	6.71E 05	6.69E 05	6.67E 05	6.65E 05	0.00
14	0.36500	6.66E 05	6.62E 05	6.59E 05	6.56E 05	6.54E 05	6.52E 05	6.50E 05	6.49E 05	6.47E 05	6.46E 05	0.00
13	0.34625	6.44E 05	6.40E 05	6.38E 05	6.36E 05	6.34E 05	6.33E 05	6.32E 05	6.31E 05	6.30E 05	6.30E 05	0.00
12	0.32750	6.21E 05	6.19E 05	6.17E 05	6.15E 05	6.15E 05	6.14E 05	6.14E 05	6.14E 05	6.14E 05	6.14E 05	0.00
11	0.29750	5.86E 05	5.85E 05	5.85E 05	5.85E 05	5.85E 05	5.86E 05	5.86E 05	5.87E 05	5.88E 05	5.89E 05	0.00
10	0.27500	5.59E 05	5.60E 05	5.62E 05	5.63E 05	5.65E 05	5.67E 05	5.69E 05	5.71E 05	5.72E 05	5.74E 05	0.00
9	0.25750	5.39E 05	5.42E 05	5.44E 05	5.47E 05	5.50E 05	5.53E 05	5.55E 05	5.58E 05	5.60E 05	5.63E 05	0.00
8	0.24250	5.22E 05	5.26E 05	5.30E 05	5.34E 05	5.38E 05	5.41E 05	5.44E 05	5.47E 05	5.50E 05	5.53E 05	0.00
7	0.21500	4.92E 05	5.00E 05	5.06E 05	5.12E 05	5.17E 05	5.22E 05	5.26E 05	5.30E 05	5.33E 05	5.37E 05	0.00
6	0.17500	4.53E 05	4.65E 05	4.75E 05	4.83E 05	4.90E 05	4.97E 05	5.03E 05	5.08E 05	5.13E 05	5.17E 05	0.00



DIMENSIONLESS STREAMLINE PLOT

[illegible]

19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.92E 02	4.59E 02	4.08E 02	3.67E 02	3.89E 02	5.13E 02	6.30E 02	6.56E 02
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	5.11E 02	4.78E 02	4.53E 02	4.67E 02	6.13E 02	9.24E 02	1.20E 03	1.29E 03
17	0.42750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	7.62E 01	3.17E 02	3.97E 02	4.51E 02	5.54E 02	8.12E 02	1.19E 03	1.49E 03	1.62E 03
16	0.40625	1.00E 00	1.00E 00	1.00E 00	1.00E 00	5.01E 02	4.62E 02	4.76E 02	5.43E 02	7.33E 02	1.07E 03	1.45E 03	1.76E 03	1.90E 03
15	0.38500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	5.05E 02	4.47E 02	5.24E 02	6.93E 02	9.78E 02	1.34E 03	1.70E 03	1.99E 03	2.13E 03
14	0.36500	1.00E 00	1.00E 00	9.49E 01	2.69E 02	4.17E 02	6.25E 02	9.01E 02	1.23E 03	1.57E 03	1.91E 03	2.18E 03	2.32E 03	2.32E 03
13	0.34625	1.00E 00	1.00E 00	4.92E 02	3.71E 02	5.23E 02	8.02E 02	1.12E 03	1.45E 03	1.78E 03	2.09E 03	2.35E 03	2.48E 03	2.48E 03
12	0.32750	1.00E 00	1.00E 00	4.10E 02	3.21E 02	6.01E 02	9.88E 02	1.33E 03	1.65E 03	1.96E 03	2.26E 03	2.51E 03	2.63E 03	2.63E 03
11	0.29750	1.00E 00	1.64E 02	1.45E 02	2.88E 02	7.83E 02	1.32E 03	1.63E 03	1.92E 03	2.22E 03	2.51E 03	2.73E 03	2.84E 03	2.84E 03
10	0.27500	1.00E 00	4.82E 02	1.34E 02	3.57E 02	1.04E 03	1.52E 03	1.79E 03	2.08E 03	2.38E 03	2.66E 03	2.88E 03	2.97E 03	2.97E 03
9	0.25750	1.00E 00	3.67E 02	7.18E 01	4.24E 02	1.21E 03	1.64E 03	1.90E 03	2.19E 03	2.49E 03	2.77E 03	2.98E 03	3.07E 03	3.07E 03
8	0.24250	1.00E 00	7.18E 00	5.14E 01	5.14E 02	1.34E 03	1.74E 03	1.99E 03	2.27E 03	2.57E 03	2.85E 03	3.06E 03	3.14E 03	3.14E 03
7	0.21500	1.00E 00	7.31E 00	7.76E 01	6.94E 02	1.59E 03	1.90E 03	2.13E 03	2.42E 03	2.72E 03	3.00E 03	3.19E 03	3.26E 03	3.26E 03
6	0.17500	1.00E 00	7.74E 00	1.48E 02	1.10E 03	1.86E 03	2.12E 03	2.34E 03	2.62E 03	2.92E 03	3.18E 03	3.35E 03	3.40E 03	3.40E 03
5	0.13000	1.00E 00	9.21E 00	3.40E 02	1.42E 03	2.15E 03	2.36E 03	2.56E 03	2.82E 03	3.10E 03	3.34E 03	3.49E 03	3.52E 03	3.52E 03
4	0.08500	1.00E 00	1.47E 01	7.72E 02	1.81E 03	2.40E 03	2.57E 03	2.76E 03	3.01E 03	3.26E 03	3.47E 03	3.60E 03	3.61E 03	3.61E 03
3	0.04500	1.00E 00	4.03E 01	1.08E 03	2.15E 03	2.57E 03	2.72E 03	2.91E 03	3.15E 03	3.39E 03	3.58E 03	3.69E 03	3.69E 03	3.69E 03
2	0.01250	1.00E 00	7.44E 01	1.54E 03	2.41E 03	2.70E 03	2.83E 03	3.03E 03	3.28E 03	3.52E 03	3.71E 03	3.81E 03	3.80E 03	3.80E 03
1-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015

0 J	Y													
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	2.17E 01	2.10E 01	2.01E 01	1.92E 01	1.84E 01	1.78E 01	1.72E 01	1.67E 01	1.63E 01	1.63E 01	1.60E 01	1.57E 01	1.54E 01
19	0.47500	6.11E 02	5.28E 02	4.34E 02	3.44E 02	2.67E 02	2.06E 02	1.62E 02	1.34E 02	1.15E 02	1.41E 02	1.00E 00	1.00E 00	1.00E 00
18	0.44750	1.24E 03	1.10E 03	9.37E 02	7.71E 02	6.22E 02	4.97E 02	4.02E 02	3.35E 02	2.86E 02	3.56E 02	1.00E 00	1.00E 00	1.00E 00
17	0.42750	1.58E 03	1.43E 03	1.24E 03	1.04E 03	8.64E 02	7.09E 02	5.88E 02	5.00E 02	4.35E 02	5.34E 02	1.00E 00	1.00E 00	1.00E 00
16	0.40625	1.87E 03	1.72E 03	1.52E 03	1.30E 03	1.09E 03	9.15E 02	7.75E 02	6.71E 02	5.94E 02	7.15E 02	1.00E 00	1.00E 00	1.00E 00
15	0.38500	2.11E 03	1.96E 03	1.74E 03	1.51E 03	1.29E 03	1.10E 03	9.43E 02	8.27E 02	7.41E 02	8.77E 02	1.00E 00	1.00E 00	1.00E 00
14	0.36500	2.30E 03	2.15E 03	1.93E 03	1.69E 03	1.45E 03	1.25E 03	1.08E 03	9.59E 02	8.66E 02	1.01E 03	1.00E 00	1.00E 00	1.00E 00
13	0.34625	2.46E 03	2.30E 03	2.08E 03	1.83E 03	1.59E 03	1.37E 03	1.20E 03	1.07E 03	9.70E 02	1.12E 03	1.00E 00	1.00E 00	1.00E 00
12	0.32750	2.60E 03	2.44E 03	2.21E 03	1.95E 03	1.70E 03	1.48E 03	1.30E 03	1.16E 03	1.06E 03	1.21E 03	1.00E 00	1.00E 00	1.00E 00
11	0.29750	2.79E 03	2.62E 03	2.38E 03	2.12E 03	1.86E 03	1.63E 03	1.44E 03	1.30E 03	1.19E 03	1.34E 03	1.00E 00	1.00E 00	1.00E 00
10	0.27500	2.92E 03	2.74E 03	2.49E 03	2.22E 03	1.96E 03	1.72E 03	1.53E 03	1.38E 03	1.27E 03	1.42E 03	1.00E 00	1.00E 00	1.00E 00
9	0.25750	3.01E 03	2.82E 03	2.57E 03	2.29E 03	2.02E 03	1.78E 03	1.59E 03	1.43E 03	1.32E 03	1.47E 03	1.00E 00	1.00E 00	1.00E 00
8	0.24250	3.08E 03	2.89E 03	2.63E 03	2.35E 03	2.07E 03	1.83E 03	1.63E 03	1.48E 03	1.36E 03	1.51E 03	1.00E 00	1.00E 00	1.00E 00
7	0.21500	3.19E 03	2.99E 03	2.72E 03	2.43E 03	2.15E 03	1.90E 03	1.70E 03	1.54E 03	1.42E 03	1.56E 03	1.00E 00	1.00E 00	1.00E 00
6	0.17500	3.32E 03	3.11E 03	2.83E 03	2.53E 03	2.24E 03	1.99E 03	1.78E 03	1.61E 03	1.49E 03	1.62E 03	1.00E 00	1.00E 00	1.00E 00
5	0.13000	3.42E 03	3.21E 03	2.93E 03	2.62E 03	2.32E 03	2.06E 03	1.84E 03	1.68E 03	1.55E 03	1.67E 03	1.00E 00	1.00E 00	1.00E 00
4	0.08500	3.50E 03	3.28E 03	3.00E 03	2.69E 03	2.38E 03	2.11E 03	1.89E 03	1.72E 03	1.59E 03	1.70E 03	1.00E 00	1.00E 00	1.00E 00
3	0.04500	3.57E 03	3.34E 03	3.05E 03	2.73E 03	2.42E 03	2.14E 03	1.92E 03	1.75E 03	1.61E 03	1.73E 03	1.00E 00	1.00E 00	1.00E 00
2	0.01250	3.66E 03	3.41E 03	3.10E 03	2.78E 03	2.46E 03	2.17E 03	1.94E 03	1.76E 03	1.63E 03	1.76E 03	1.00E 00	1.00E 00	1.00E 00
1-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

I	X/D	S.S.COEFF.
2	3.148E-02	1.734E-02
3	9.443E-02	1.167E-02
4	1.643E-01	7.430E-03

105	0.7925E-01	0.5914E-01	0.2543E-01	0.2783E-01	0.1016E-01	0.1145E	09	0.5117E	01-0.5374E-02	0.1754E	02	0.2014E	04	0.2855E	04
106	0.7763E-01	0.5720E-01	0.2470E-01	0.2707E-01	0.1003E-01	0.1215E	09	0.5106E	01-0.5806E-02	0.1755E	02	0.2015E	04	0.2863E	04
107	0.7382E-01	0.6101E-01	0.2394E-01	0.2628E-01	0.9890E-02	0.1280E	09	0.5094E	01-0.5737E-02	0.1756E	02	0.2016E	04	0.2871E	04
108	0.7272E-01	0.5833E-01	0.2320E-01	0.2519E-01	0.9697E-02	0.1282E	09	0.5085E	01-0.4982E-02	0.1758E	02	0.2017E	04	0.2879E	04
109	0.7252E-01	0.5132E-01	0.2256E-01	0.2434E-01	0.9367E-02	0.1225E	09	0.5075E	01-0.5139E-02	0.1759E	02	0.2018E	04	0.2887E	04
110	0.6872E-01	0.5420E-01	0.2190E-01	0.2342E-01	0.9061E-02	0.1210E	09	0.5064E	01-0.4934E-02	0.1760E	02	0.2018E	04	0.2894E	04
111	0.6817E-01	0.5076E-01	0.2127E-01	0.2229E-01	0.8829E-02	0.1231E	09	0.5054E	01-0.4738E-02	0.1762E	02	0.2020E	04	0.2901E	04
112	0.6583E-01	0.4909E-01	0.2067E-01	0.2146E-01	0.8656E-02	0.1260E	09	0.5045E	01-0.4433E-02	0.1763E	02	0.2021E	04	0.2908E	04
113	0.6431E-01	0.4670E-01	0.2008E-01	0.2059E-01	0.8482E-02	0.1283E	09	0.5036E	01-0.4135E-02	0.1764E	02	0.2022E	04	0.2915E	04
114	0.6254E-01	0.4454E-01	0.1950E-01	0.1985E-01	0.8300E-02	0.1295E	09	0.5027E	01-0.3805E-02	0.1765E	02	0.2023E	04	0.2921E	04
115	0.6087E-01	0.4249E-01	0.1895E-01	0.1902E-01	0.8113E-02	0.1300E	09	0.5019E	01-0.3477E-02	0.1767E	02	0.2023E	04	0.2928E	04
116	0.5929E-01	0.4048E-01	0.1841E-01	0.1831E-01	0.7922E-02	0.1306E	09	0.5012E	01-0.3138E-02	0.1768E	02	0.2024E	04	0.2934E	04
117	0.5775E-01	0.3856E-01	0.1794E-01	0.1760E-01	0.7738E-02	0.1312E	09	0.5004E	01-0.2801E-02	0.1769E	02	0.2025E	04	0.2940E	04
118	0.5612E-01	0.3667E-01	0.1750E-01	0.1689E-01	0.7563E-02	0.1317E	09	0.4998E	01-0.2461E-02	0.1770E	02	0.2026E	04	0.2945E	04
119	0.5453E-01	0.3481E-01	0.1706E-01	0.1620E-01	0.7406E-02	0.1324E	09	0.4992E	01-0.2123E-02	0.1771E	02	0.2027E	04	0.2951E	04
120	0.5301E-01	0.3296E-01	0.1665E-01	0.1552E-01	0.7268E-02	0.1329E	09	0.4986E	01-0.1788E-02	0.1772E	02	0.2028E	04	0.2956E	04
121	0.5154E-01	0.3128E-01	0.1626E-01	0.1494E-01	0.7131E-02	0.1334E	09	0.4981E	01-0.1456E-02	0.1774E	02	0.2029E	04	0.2961E	04
122	0.5017E-01	0.2970E-01	0.1589E-01	0.1433E-01	0.6981E-02	0.1338E	09	0.4976E	01-0.1129E-02	0.1775E	02	0.2030E	04	0.2966E	04
123	0.4888E-01	0.2839E-01	0.1555E-01	0.1375E-01	0.6819E-02	0.1346E	09	0.4972E	01-0.8099E-03	0.1776E	02	0.2031E	04	0.2970E	04
124	0.4764E-01	0.2712E-01	0.1524E-01	0.1320E-01	0.6654E-02	0.1337E	09	0.4969E	01-0.4974E-03	0.1777E	02	0.2032E	04	0.2975E	04
125	0.4650E-01	0.2585E-01	0.1497E-01	0.1266E-01	0.6488E-02	0.1346E	09	0.4966E	01-0.1946E-03	0.1778E	02	0.2033E	04	0.2979E	04
126	0.4544E-01	0.2463E-01	0.1471E-01	0.1216E-01	0.6320E-02	0.1348E	09	0.4963E	01-0.9858E-04	0.1779E	02	0.2034E	04	0.2983E	04
127	0.4445E-01	0.2348E-01	0.1448E-01	0.1168E-01	0.6159E-02	0.1350E	09	0.4961E	01-0.3818E-03	0.1780E	02	0.2035E	04	0.2987E	04
128	0.4360E-01	0.2242E-01	0.1426E-01	0.1123E-01	0.6003E-02	0.1350E	09	0.4960E	01-0.6537E-03	0.1780E	02	0.2036E	04	0.2991E	04
129	0.4279E-01	0.2149E-01	0.1405E-01	0.1084E-01	0.5849E-02	0.1355E	09	0.4959E	01-0.9132E-03	0.1781E	02	0.2037E	04	0.2995E	04
130	0.4203E-01	0.2066E-01	0.1387E-01	0.1041E-01	0.5703E-02	0.1351E	09	0.4958E	01-0.1161E-02	0.1782E	02	0.2037E	04	0.2998E	04
131	0.4132E-01	0.1989E-01	0.1371E-01	0.1006E-01	0.5554E-02	0.1355E	09	0.4958E	01-0.1395E-02	0.1783E	02	0.2038E	04	0.3001E	04
132	0.4070E-01	0.1916E-01	0.1358E-01	0.9687E-02	0.5403E-02	0.1358E	09	0.4958E	01-0.1615E-02	0.1784E	02	0.2039E	04	0.3004E	04
133	0.4015E-01	0.1848E-01	0.1345E-01	0.9395E-02	0.5253E-02	0.1350E	09	0.4959E	01-0.1821E-02	0.1785E	02	0.2040E	04	0.3007E	04
134	0.3966E-01	0.1785E-01	0.1333E-01	0.9080E-02	0.5106E-02	0.1351E	09	0.4960E	01-0.2013E-02	0.1785E	02	0.2041E	04	0.3010E	04
135	0.3916E-01	0.1733E-01	0.1324E-01	0.8821E-02	0.4961E-02	0.1349E	09	0.4962E	01-0.2190E-02	0.1786E	02	0.2042E	04	0.3013E	04
136	0.3867E-01	0.1687E-01	0.1316E-01	0.8544E-02	0.4824E-02	0.1344E	09	0.4963E	01-0.2353E-02	0.1787E	02	0.2043E	04	0.3015E	04
137	0.3814E-01	0.1651E-01	0.1310E-01	0.8333E-02	0.4693E-02	0.1347E	09	0.4966E	01-0.2501E-02	0.1788E	02	0.2043E	04	0.3018E	04
138	0.3761E-01	0.1618E-01	0.1305E-01	0.8114E-02	0.4561E-02	0.1341E	09	0.4968E	01-0.2635E-02	0.1788E	02	0.2044E	04	0.3020E	04
139	0.3707E-01	0.1597E-01	0.1302E-01	0.7934E-02	0.4437E-02	0.1338E	09	0.4971E	01-0.2755E-02	0.1789E	02	0.2045E	04	0.3022E	04
140	0.3653E-01	0.1587E-01	0.1300E-01	0.7780E-02	0.4315E-02	0.1334E	09	0.4974E	01-0.2860E-02	0.1790E	02	0.2046E	04	0.3024E	04
141	0.3597E-01	0.1583E-01	0.1302E-01	0.7609E-02	0.4197E-02	0.1327E	09	0.4977E	01-0.2951E-02	0.1790E	02	0.2047E	04	0.3026E	04
142	0.3541E-01	0.1584E-01	0.1305E-01	0.7513E-02	0.4081E-02	0.1325E	09	0.4980E	01-0.3029E-02	0.1791E	02	0.2047E	04	0.3028E	04
143	0.3484E-01	0.1590E-01	0.1310E-01	0.7407E-02	0.3967E-02	0.1319E	09	0.4984E	01-0.3092E-02	0.1791E	02	0.2048E	04	0.3030E	04
144	0.3428E-01	0.1597E-01	0.1315E-01	0.7351E-02	0.3860E-02	0.1314E	09	0.4988E	01-0.3143E-02	0.1792E	02	0.2049E	04	0.3031E	04
145	0.3374E-01	0.1606E-01	0.1319E-01	0.7247E-02	0.3704E-02	0.1203E	09	0.4992E	01-0.3183E-02	0.1793E	02	0.2050E	04	0.3033E	04
146	0.3320E-01	0.1616E-01	0.1325E-01	0.7224E-02	0.3579E-02	0.1179E	09	0.4996E	01-0.3211E-02	0.1793E	02	0.2050E	04	0.3034E	04
147	0.3265E-01	0.1622E-01	0.1331E-01	0.7173E-02	0.3477E-02	0.1183E	09	0.5000E	01-0.3228E-02	0.1794E	02	0.2051E	04	0.3036E	04
148	0.3209E-01	0.1626E-01	0.1337E-01	0.7181E-02	0.3386E-02	0.1187E	09	0.5004E	01-0.3234E-02	0.1794E	02	0.2052E	04	0.3037E	04
149	0.3153E-01	0.1628E-01	0.1342E-01	0.7173E-02	0.3307E-02	0.1187E	09	0.5009E	01-0.3231E-02	0.1795E	02	0.2053E	04	0.3038E	04
150	0.3095E-01	0.1628E-01	0.1348E-01	0.7165E-02	0.3236E-02	0.1185E	09	0.5013E	01-0.3219E-02	0.1795E	02	0.2053E	04	0.3040E	04
151	0.3036E-01	0.1629E-01	0.1355E-01	0.7158E-02	0.3173E-02	0.1184E	09	0.5018E	01-0.3196E-02	0.1796E	02	0.2054E	04	0.3041E	04
152	0.2976E-01	0.1626E-01	0.1360E-01	0.7172E-02	0.3122E-02	0.1175E	09	0.5023E	01-0.3166E-02	0.1796E	02	0.2055E	04	0.3042E	04
153	0.2916E-01	0.1625E-01	0.1366E-01	0.7204E-02	0.3077E-02	0.1173E	09	0.5027E	01-0.3128E-02	0.1797E	02	0.2055E	04	0.3043E	04
154	0.2855E-01	0.1622E-01	0.1372E-01	0.7195E-02	0.3040E-02	0.1163E	09	0.5032E	01-0.3080E-02	0.1797E	02	0.2056E	04	0.3044E	04
155	0.2796E-01	0.1618E-01	0.1377E-01	0.7232E-02	0.3008E-02	0.1155E	09	0.5036E	01-0.3026E-02	0.1798E	02	0.2057E	04	0.3045E	04
156	0.2736E-01	0.1611E-01	0.1382E-01	0.7263E-02	0.2980E-02	0.1146E	09	0.5041E	01-0.2965E-02	0.1798E	02	0.2057E	04	0.3046E	04
157	0.2677E-01	0.1602E-01	0.1386E-01	0.7279E-02	0.2951E-02	0.1144E	09	0.5045E	01-0.2898E-02	0.1799E	02	0.2058E	04	0.3047E	04
158	0.2619E-01	0.1591E-01	0.1391E-01	0.7312E-02	0.2920E-02	0.1131E	09	0.5050E	01-0.2824E-02	0.1799E	02	0.2059E	04	0.3048E	04

7	0.02687	2.70E 01	9.86E 00	4.56E 01	1.01E 02	7.81E 01	8.16E 01	9.03E 01	9.77E 01	1.01E 02	1.00E 02	9.36E 01	8.26E 01
6	0.02187	2.70E 01	1.10E 01	6.93E 01	1.03E 02	7.21E 01	7.62E 01	8.40E 01	9.20E 01	9.69E 01	9.67E 01	9.11E 01	8.07E 01
5	0.01625	2.70E 01	1.44E 01	1.13E 02	7.56E 01	6.85E 01	7.21E 01	7.88E 01	8.61E 01	9.12E 01	9.17E 01	8.68E 01	7.73E 01
4	0.01062	2.70E 01	2.44E 01	1.62E 02	6.75E 01	6.65E 01	6.96E 01	7.53E 01	8.16E 01	8.62E 01	8.69E 01	8.24E 01	7.37E 01
3	0.00562	2.70E 01	5.08E 01	1.09E 02	6.63E 01	6.56E 01	6.83E 01	7.35E 01	7.91E 01	8.32E 01	8.38E 01	7.97E 01	7.14E 01
2	0.00156	2.70E 01	6.98E 01	1.07E 02	6.59E 01	6.54E 01	6.82E 01	7.33E 01	7.87E 01	8.25E 01	8.30E 01	7.89E 01	7.08E 01
1	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	5.26E 00	4.85E 00	4.41E 00	4.02E 00	3.69E 00	3.42E 00	3.20E 00	3.02E 00	2.87E 00	2.89E 00	2.70E 01	
19	0.05937	2.68E 01	2.26E 01	1.85E 01	1.48E 01	1.17E 01	9.40E 00	7.73E 00	6.60E 00	5.85E 00	7.09E 00	2.70E 01	
18	0.05594	3.84E 01	3.21E 01	2.59E 01	2.06E 01	1.62E 01	1.29E 01	1.04E 01	8.72E 00	7.53E 00	9.85E 00	2.70E 01	
17	0.05344	4.44E 01	3.68E 01	2.96E 01	2.34E 01	1.85E 01	1.46E 01	1.18E 01	9.92E 00	8.56E 00	1.15E 01	2.70E 01	
16	0.05078	4.98E 01	4.10E 01	3.28E 01	2.59E 01	2.04E 01	1.62E 01	1.31E 01	1.10E 01	9.53E 00	1.30E 01	2.70E 01	
15	0.04812	5.44E 01	4.45E 01	3.54E 01	2.79E 01	2.20E 01	1.75E 01	1.42E 01	1.19E 01	1.03E 01	1.42E 01	2.70E 01	
14	0.04562	5.82E 01	4.73E 01	3.76E 01	2.95E 01	2.32E 01	1.85E 01	1.50E 01	1.26E 01	1.10E 01	1.51E 01	2.70E 01	
13	0.04328	6.12E 01	4.96E 01	3.93E 01	3.08E 01	2.42E 01	1.92E 01	1.57E 01	1.32E 01	1.15E 01	1.58E 01	2.70E 01	
12	0.04094	6.37E 01	5.15E 01	4.07E 01	3.19E 01	2.50E 01	1.99E 01	1.62E 01	1.36E 01	1.19E 01	1.63E 01	2.70E 01	
11	0.03719	6.67E 01	5.37E 01	4.24E 01	3.31E 01	2.60E 01	2.06E 01	1.68E 01	1.41E 01	1.23E 01	1.68E 01	2.70E 01	
10	0.03437	6.82E 01	5.48E 01	4.32E 01	3.37E 01	2.64E 01	2.10E 01	1.71E 01	1.44E 01	1.25E 01	1.69E 01	2.70E 01	
9	0.03219	6.89E 01	5.54E 01	4.36E 01	3.40E 01	2.66E 01	2.11E 01	1.72E 01	1.45E 01	1.26E 01	1.69E 01	2.70E 01	
8	0.03031	6.92E 01	5.56E 01	4.37E 01	3.41E 01	2.67E 01	2.12E 01	1.72E 01	1.45E 01	1.26E 01	1.68E 01	2.70E 01	
7	0.02687	6.91E 01	5.56E 01	4.37E 01	3.41E 01	2.67E 01	2.11E 01	1.72E 01	1.44E 01	1.26E 01	1.65E 01	2.70E 01	
6	0.02187	6.78E 01	5.47E 01	4.31E 01	3.36E 01	2.62E 01	2.08E 01	1.69E 01	1.42E 01	1.23E 01	1.59E 01	2.70E 01	
5	0.01625	6.53E 01	5.29E 01	4.18E 01	3.26E 01	2.55E 01	2.02E 01	1.64E 01	1.38E 01	1.20E 01	1.50E 01	2.70E 01	
4	0.01062	6.25E 01	5.09E 01	4.04E 01	3.17E 01	2.48E 01	1.96E 01	1.59E 01	1.34E 01	1.16E 01	1.42E 01	2.70E 01	
3	0.00562	6.08E 01	4.97E 01	3.96E 01	3.11E 01	2.44E 01	1.92E 01	1.56E 01	1.31E 01	1.14E 01	1.38E 01	2.70E 01	
2	0.00156	6.03E 01	4.94E 01	3.94E 01	3.10E 01	2.43E 01	1.93E 01	1.57E 01	1.32E 01	1.14E 01	1.38E 01	2.70E 01	
1	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	7.71E 03	7.77E 03	5.75E 03	4.63E 03	4.65E 03	5.97E 03	7.48E 03	8.00E 03
19	0.05937	0.00	0.00	0.00	0.00	1.26E 04	1.61E 04	1.16E 04	8.19E 03	6.67E 03	6.91E 03	7.60E 03	7.56E 03
18	0.05594	0.00	0.00	0.00	0.00	3.03E 04	2.40E 04	1.65E 04	1.18E 04	9.77E 03	9.43E 03	9.12E 03	8.20E 03
17	0.05344	0.00	0.00	0.00	2.18E 04	2.91E 04	2.26E 04	1.71E 04	1.39E 04	1.25E 04	1.17E 04	1.06E 04	8.95E 03
16	0.05078	0.00	0.00	0.00	4.50E 04	3.31E 04	2.42E 04	1.93E 04	1.72E 04	1.60E 04	1.44E 04	1.23E 04	9.86E 03
15	0.04812	0.00	0.00	0.00	5.05E 04	3.52E 04	2.66E 04	2.30E 04	2.15E 04	1.97E 04	1.70E 04	1.38E 04	1.07E 04
14	0.04562	0.00	0.00	4.59E 04	4.37E 04	3.47E 04	2.96E 04	2.76E 04	2.58E 04	2.27E 04	1.89E 04	1.51E 04	1.14E 04
13	0.04328	0.00	0.00	6.85E 04	4.43E 04	3.69E 04	3.29E 04	3.14E 04	2.88E 04	2.47E 04	2.03E 04	1.59E 04	1.20E 04
12	0.04094	0.00	0.00	4.28E 04	3.92E 04	3.87E 04	3.48E 04	3.34E 04	3.03E 04	2.58E 04	2.11E 04	1.65E 04	1.24E 04
11	0.03719	0.00	4.98E 04	4.31E 04	4.48E 04	4.53E 04	3.46E 04	3.35E 04	3.06E 04	2.62E 04	2.15E 04	1.69E 04	1.27E 04
10	0.03437	0.00	5.93E 04	4.67E 04	5.32E 04	3.96E 04	3.09E 04	3.10E 04	2.90E 04	2.54E 04	2.12E 04	1.68E 04	1.26E 04
9	0.03219	0.00	2.25E 04	4.93E 04	5.89E 04	3.32E 04	2.73E 04	2.83E 04	2.71E 04	2.43E 04	2.06E 04	1.66E 04	1.25E 04
8	0.03031	4.49E 05	8.42E 04	6.25E 04	6.31E 04	2.83E 04	2.43E 04	2.57E 04	2.53E 04	2.32E 04	2.00E 04	1.62E 04	1.23E 04
7	0.02687	4.49E 05	8.61E 04	7.41E 04	6.41E 04	2.13E 04	1.98E 04	2.15E 04	2.20E 04	2.10E 04	1.86E 04	1.54E 04	1.18E 04
6	0.02187	4.49E 05	9.18E 04	9.66E 04	4.51E 04	1.56E 04	1.55E 04	1.70E 04	1.81E 04	1.79E 04	1.64E 04	1.39E 04	1.08E 04
5	0.01625	4.49E 05	1.07E 05	1.27E 05	2.09E 04	1.23E 04	1.25E 04	1.36E 04	1.47E 04	1.50E 04	1.41E 04	1.21E 04	9.56E 03
4	0.01062	4.49E 05	1.42E 05	1.11E 05	1.35E 04	1.05E 04	1.07E 04	1.15E 04	1.24E 04	1.27E 04	1.21E 04	1.06E 04	8.48E 03
3	0.00562	4.49E 05	2.03E 05	4.83E 04	1.12E 04	9.50E 03	9.70E 03	1.04E 04	1.11E 04	1.14E 04	1.09E 04	9.65E 03	7.79E 03

5	0.13000	4.16E 05	4.33E 05	4.46E 05	4.57E 05	4.66E 05	4.75E 05	4.82E 05	4.89E 05	4.94E 05	5.00E 05		0.00
4	0.08500	3.89E 05	4.09E 05	4.25E 05	4.38E 05	4.49E 05	4.59E 05	4.67E 05	4.75E 05	4.81E 05	4.88E 05		0.00
3	0.04500	3.73E 05	3.95E 05	4.13E 05	4.28E 05	4.40E 05	4.50E 05	4.59E 05	4.67E 05	4.74E 05	4.81E 05		0.00
2	0.01250	3.67E 05	3.90E 05	4.09E 05	4.24E 05	4.36E 05	4.47E 05	4.56E 05	4.64E 05	4.71E 05	4.78E 05		0.00
1-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
O*-**--*--*--*--*--*--*--*--*--*--*													
DIMENSIONLESS TURBULENCE ENERGY													
-*--*--*--*--*--*--*--*--*--*--*--*													
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
O J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	5.92E-03	5.94E-03	4.86E-03	4.21E-03	4.22E-03	4.99E-03	5.80E-03	6.06E-03
19	0.47500	0.00	0.00	0.00	0.00	3.22E-02	4.03E-02	3.25E-02	2.62E-02	2.49E-02	2.89E-02	3.28E-02	3.29E-02
18	0.44750	0.00	0.00	0.00	0.00	5.77E-02	5.08E-02	4.14E-02	3.61E-02	3.81E-02	4.52E-02	4.95E-02	4.81E-02
17	0.42750	0.00	0.00	0.00	1.88E-02	4.63E-02	4.61E-02	4.29E-02	4.30E-02	4.92E-02	5.67E-02	5.95E-02	5.63E-02
16	0.40625	0.00	0.00	0.00	7.01E-02	5.97E-02	5.24E-02	5.01E-02	5.47E-02	6.30E-02	6.90E-02	6.93E-02	6.41E-02
15	0.38500	0.00	0.00	0.00	7.56E-02	6.17E-02	5.83E-02	6.16E-02	6.99E-02	7.73E-02	8.04E-02	7.81E-02	7.08E-02
14	0.36500	0.00	0.00	3.08E-02	5.43E-02	6.05E-02	6.73E-02	7.63E-02	8.48E-02	8.95E-02	8.98E-02	8.53E-02	7.63E-02
13	0.34625	0.00	0.00	8.65E-02	6.50E-02	7.04E-02	7.97E-02	8.99E-02	9.67E-02	9.89E-02	9.71E-02	9.10E-02	8.07E-02
12	0.32750	0.00	0.00	6.32E-02	5.88E-02	7.75E-02	9.00E-02	1.00E-01	1.05E-01	1.06E-01	1.03E-01	9.56E-02	8.44E-02
11	0.29750	0.00	4.26E-02	4.13E-02	6.19E-02	9.55E-02	1.02E-01	1.10E-01	1.14E-01	1.13E-01	1.09E-01	1.01E-01	8.88E-02
10	0.27500	0.00	7.86E-02	4.33E-02	7.61E-02	9.95E-02	1.02E-01	1.11E-01	1.15E-01	1.15E-01	1.12E-01	1.03E-01	9.08E-02
9	0.25750	0.00	4.12E-02	3.65E-02	8.71E-02	9.69E-02	9.95E-02	1.09E-01	1.14E-01	1.16E-01	1.12E-01	1.04E-01	9.17E-02
8	0.24250	3.00E-02	1.05E-02	3.86E-02	9.80E-02	9.37E-02	9.62E-02	1.06E-01	1.13E-01	1.15E-01	1.12E-01	1.05E-01	9.21E-02
7	0.21500	3.00E-02	1.10E-02	5.07E-02	1.12E-01	8.68E-02	9.07E-02	1.00E-01	1.09E-01	1.12E-01	1.11E-01	1.04E-01	9.18E-02
6	0.17500	3.00E-02	1.22E-02	7.71E-02	1.15E-01	8.01E-02	8.46E-02	9.33E-02	1.02E-01	1.08E-01	1.07E-01	1.01E-01	8.97E-02
5	0.13000	3.00E-02	1.60E-02	1.25E-01	8.40E-02	7.61E-02	8.01E-02	8.75E-02	9.57E-02	1.01E-01	1.02E-01	9.64E-02	8.59E-02
4	0.08500	3.00E-02											


```

0- - - - -
1X-AXIS IS XI
Y-AXES ARE          00          02          04          06          08          10
SYMBOL              0          2          4          6          8          1
MAXIMUM VALUES  0.381E 00  0.408E 00  0.430E 00  0.452E 00  0.475E 00  0.500E 00

```

[illegible]

159	0.2561E-01	0.1582E-01	0.1394E-01	0.7362E-02	0.2890E-02	0.1126E	09	0.5054E	01	0.2747E-02	0.1800E	02	0.2059E	04	0.3048E	04
160	0.2504E-01	0.1572E-01	0.1398E-01	0.7374E-02	0.2859E-02	0.1116E	09	0.5059E	01	0.2664E-02	0.1800E	02	0.2060E	04	0.3049E	04
161	0.2448E-01	0.1562E-01	0.1400E-01	0.7424E-02	0.2830E-02	0.1110E	09	0.5063E	01	0.2577E-02	0.1801E	02	0.2060E	04	0.3050E	04
162	0.2392E-01	0.1553E-01	0.1403E-01	0.7410E-02	0.2796E-02	0.1100E	09	0.5067E	01	0.2487E-02	0.1801E	02	0.2061E	04	0.3051E	04
163	0.2337E-01	0.1540E-01	0.1405E-01	0.7460E-02	0.2767E-02	0.1092E	09	0.5071E	01	0.2393E-02	0.1802E	02	0.2062E	04	0.3052E	04
164	0.2283E-01	0.1531E-01	0.1407E-01	0.7463E-02	0.2735E-02	0.1079E	09	0.5075E	01	0.2298E-02	0.1802E	02	0.2062E	04	0.3053E	04
165	0.2231E-01	0.1519E-01	0.1407E-01	0.7533E-02	0.2706E-02	0.1074E	09	0.5079E	01	0.2199E-02	0.1803E	02	0.2063E	04	0.3054E	04
166	0.2180E-01	0.1509E-01	0.1408E-01	0.7560E-02	0.2674E-02	0.1065E	09	0.5082E	01	0.2100E-02	0.1803E	02	0.2063E	04	0.3054E	04
167	0.2131E-01	0.1500E-01	0.1408E-01	0.7558E-02	0.2645E-02	0.1057E	09	0.5086E	01	0.2000E-02	0.1804E	02	0.2064E	04	0.3055E	04
168	0.2081E-01	0.1489E-01	0.1407E-01	0.7567E-02	0.2618E-02	0.1042E	09	0.5090E	01	0.1899E-02	0.1804E	02	0.2065E	04	0.3056E	04
169	0.2035E-01	0.1480E-01	0.1406E-01	0.7568E-02	0.2596E-02	0.1036E	09	0.5093E	01	0.1798E-02	0.1805E	02	0.2065E	04	0.3057E	04
170	0.1988E-01	0.1472E-01	0.1404E-01	0.7619E-02	0.2577E-02	0.1023E	09	0.5096E	01	0.1698E-02	0.1805E	02	0.2066E	04	0.3058E	04
171	0.1944E-01	0.1463E-01	0.1401E-01	0.7603E-02	0.2559E-02	0.1014E	09	0.5099E	01	0.1599E-02	0.1806E	02	0.2066E	04	0.3058E	04
172	0.1902E-01	0.1456E-01	0.1398E-01	0.7638E-02	0.2543E-02	0.1010E	09	0.5102E	01	0.1500E-02	0.1806E	02	0.2067E	04	0.3059E	04
173	0.1860E-01	0.1451E-01	0.1395E-01	0.7660E-02	0.2525E-02	0.9972E	08	0.5105E	01	0.1402E-02	0.1807E	02	0.2067E	04	0.3060E	04
174	0.1820E-01	0.1446E-01	0.1392E-01	0.7619E-02	0.2507E-02	0.9896E	08	0.5107E	01	0.1307E-02	0.1807E	02	0.2068E	04	0.3061E	04
175	0.1781E-01	0.1444E-01	0.1387E-01	0.7675E-02	0.2487E-02	0.9783E	08	0.5110E	01	0.1213E-02	0.1808E	02	0.2068E	04	0.3062E	04
176	0.1744E-01	0.1441E-01	0.1382E-01	0.7612E-02	0.2468E-02	0.9732E	08	0.5112E	01	0.1122E-02	0.1808E	02	0.2069E	04	0.3062E	04
177	0.1708E-01	0.1438E-01	0.1377E-01	0.7610E-02	0.2450E-02	0.9602E	08	0.5114E	01	0.1034E-02	0.1809E	02	0.2069E	04	0.3063E	04
178	0.1674E-01	0.1436E-01	0.1371E-01	0.7640E-02	0.2429E-02	0.9512E	08	0.5116E	01	0.9483E-03	0.1809E	02	0.2070E	04	0.3064E	04
179	0.1641E-01	0.1432E-01	0.1365E-01	0.7589E-02	0.2410E-02	0.9437E	08	0.5118E	01	0.8656E-03	0.1810E	02	0.2071E	04	0.3065E	04
180	0.1610E-01	0.1430E-01	0.1358E-01	0.7599E-02	0.2387E-02	0.9313E	08	0.5120E	01	0.7859E-03	0.1810E	02	0.2071E	04	0.3066E	04
181	0.1580E-01	0.1428E-01	0.1351E-01	0.7539E-02	0.2366E-02	0.9249E	08	0.5122E	01	0.7102E-03	0.1811E	02	0.2072E	04	0.3067E	04
182	0.1552E-01	0.1428E-01	0.1344E-01	0.7553E-02	0.2344E-02	0.9185E	08	0.5124E	01	0.6381E-03	0.1811E	02	0.2072E	04	0.3067E	04
183	0.1524E-01	0.1426E-01	0.1336E-01	0.7513E-02	0.2321E-02	0.9092E	08	0.5125E	01	0.5698E-03	0.1812E	02	0.2073E	04	0.3068E	04
184	0.1498E-01	0.1425E-01	0.1328E-01	0.7475E-02	0.2298E-02	0.9013E	08	0.5126E	01	0.5048E-03	0.1812E	02	0.2073E	04	0.3069E	04
185	0.1473E-01	0.1422E-01	0.1320E-01	0.7469E-02	0.2277E-02	0.8893E	08	0.5128E	01	0.4437E-03	0.1813E	02	0.2074E	04	0.3070E	04
186	0.1450E-01	0.1419E-01	0.1311E-01	0.7419E-02	0.2255E-02	0.8800E	08	0.5129E	01	0.3862E-03	0.1813E	02	0.2074E	04	0.3071E	04
187	0.1428E-01	0.1414E-01	0.1303E-01	0.7359E-02	0.2231E-02	0.8747E	08	0.5130E	01	0.3329E-03	0.1814E	02	0.2075E	04	0.3071E	04
188	0.1407E-01	0.1410E-01	0.1293E-01	0.7328E-02	0.2209E-02	0.8630E	08	0.5131E	01	0.2830E-03	0.1814E	02	0.2075E	04	0.3072E	04
189	0.1387E-01	0.1405E-01	0.1284E-01	0.7298E-02	0.2187E-02	0.8597E	08	0.5131E	01	0.2370E-03	0.1815E	02	0.2076E	04	0.3073E	04
190	0.1369E-01	0.1397E-01	0.1274E-01	0.7252E-02	0.2163E-02	0.8494E	08	0.5132E	01	0.1951E-03	0.1815E	02	0.2076E	04	0.3074E	04
191	0.1351E-01	0.1391E-01	0.1265E-01	0.7203E-02	0.2140E-02	0.8426E	08	0.5133E	01	0.1566E-03	0.1816E	02	0.2077E	04	0.3075E	04
192	0.1334E-01	0.1383E-01	0.1255E-01	0.7190E-02	0.2118E-02	0.8358E	08	0.5133E	01	0.1215E-03	0.1816E	02	0.2077E	04	0.3075E	04
193	0.1319E-01	0.1376E-01	0.1245E-01	0.7133E-02	0.2096E-02	0.8260E	08	0.5134E	01	0.9063E-04	0.1817E	02	0.2077E	04	0.3076E	04
194	0.1304E-01	0.1366E-01	0.1235E-01	0.7049E-02	0.2076E-02	0.8217E	08	0.5134E	01	0.6190E-04	0.1818E	02	0.2078E	04	0.3077E	04
195	0.1290E-01	0.1357E-01	0.1225E-01	0.7009E-02	0.2051E-02	0.8104E	08	0.5135E	01	0.3775E-04	0.1818E	02	0.2078E	04	0.3078E	04
196	0.1277E-01	0.1348E-01	0.1215E-01	0.6963E-02	0.2030E-02	0.8072E	08	0.5135E	01	0.1667E-04	0.1819E	02	0.2079E	04	0.3078E	04
197	0.1266E-01	0.1338E-01	0.1205E-01	0.6899E-02	0.2008E-02	0.7992E	08	0.5136E	01	0.2396E-05	0.1819E	02	0.2079E	04	0.3079E	04
198	0.1254E-01	0.1328E-01	0.1195E-01	0.6890E-02	0.1986E-02	0.7900E	08	0.5136E	01	0.1786E-04	0.1820E	02	0.2080E	04	0.3080E	04
199	0.1244E-01	0.1317E-01	0.1184E-01	0.6801E-02	0.1963E-02	0.7784E	08	0.5136E	01	0.3125E-04	0.1820E	02	0.2080E	04	0.3081E	04
200	0.1234E-01	0.1305E-01	0.1175E-01	0.6763E-02	0.1943E-02	0.7794E	08	0.5136E	01	0.4139E-04	0.1821E	02	0.2081E	04	0.3081E	04

0- - - - -

SWIRL CASE WITH LFS = 7
AND NSBR = 0

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 2.000

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 70.000

COMPUTED INLET SWIRL NUMBER = 1.8347


```

0*- - - - - DIMENSIONLESS LENGTH SCALE - - - - -
0      I =      2      3      4      5      6      7      8      9      10      11      12      13
      X = 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552 0.15786
0 J      Y
21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
20 0.06187      0.00      0.00      0.00 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02
19 0.05937      0.00      0.00      0.00 1.98E-01 2.17E-01 2.18E-01 2.24E-01 2.54E-01 3.07E-01 3.38E-01 3.41E-01 3.27E-01
18 0.05594      0.00      0.00      0.00 1.98E-01 2.06E-01 2.21E-01 2.51E-01 3.29E-01 4.41E-01 5.21E-01 5.55E-01 5.56E-01
17 0.05344      0.00      0.00 5.10E-02 1.48E-01 1.89E-01 2.24E-01 2.78E-01 3.77E-01 4.97E-01 5.92E-01 6.45E-01 6.62E-01
16 0.05078      0.00      0.00 1.78E-01 1.90E-01 2.14E-01 2.52E-01 3.22E-01 4.27E-01 5.42E-01 6.43E-01 7.11E-01 7.43E-01
15 0.04812      0.00      0.00 1.78E-01 1.88E-01 2.28E-01 2.87E-01 3.70E-01 4.72E-01 5.81E-01 6.83E-01 7.59E-01 8.03E-01
14 0.04562      0.00 5.10E-02 1.25E-01 1.85E-01 2.55E-01 3.30E-01 4.14E-01 5.10E-01 6.15E-01 7.15E-01 7.96E-01 8.48E-01
13 0.04328      0.00 1.60E-01 1.61E-01 2.18E-01 2.95E-01 3.71E-01 4.52E-01 5.44E-01 6.45E-01 7.45E-01 8.28E-01 8.84E-01
12 0.04094      0.00 1.60E-01 1.57E-01 2.41E-01 3.35E-01 4.11E-01 4.88E-01 5.77E-01 6.76E-01 7.73E-01 8.57E-01 9.17E-01
11 0.03719 7.64E-02 8.42E-02 1.49E-01 2.81E-01 4.07E-01 4.71E-01 5.44E-01 6.30E-01 7.25E-01 8.20E-01 9.03E-01 9.64E-01
10 0.03437 1.60E-01 8.32E-02 1.71E-01 3.42E-01 4.58E-01 5.14E-01 5.84E-01 6.68E-01 7.61E-01 8.54E-01 9.36E-01 9.98E-01
9 0.03219 1.60E-01 6.11E-02 1.89E-01 3.93E-01 4.97E-01 5.48E-01 6.16E-01 6.99E-01 7.90E-01 8.80E-01 9.61E-01 1.02E 00
8 0.03031 5.55E-03 5.23E-02 2.10E-01 4.37E-01 5.31E-01 5.80E-01 6.46E-01 7.26E-01 8.14E-01 9.02E-01 9.82E-01 1.04E 00
7 0.02687 5.75E-03 6.65E-02 2.54E-01 5.20E-01 5.95E-01 6.39E-01 7.01E-01 7.77E-01 8.60E-01 9.44E-01 1.02E 00 1.08E 00
6 0.02187 6.35E-03 9.56E-02 3.73E-01 6.27E-01 6.86E-01 7.26E-01 7.82E-01 8.51E-01 9.27E-01 1.00E 00 1.08E 00 1.14E 00
5 0.01625 8.19E-03 1.51E-01 5.03E-01 7.36E-01 7.84E-01 8.22E-01 8.72E-01 9.32E-01 1.00E 00 1.07E 00 1.14E 00 1.19E 00
4 0.01062 1.36E-02 2.97E-01 6.57E-01 8.30E-01 8.71E-01 9.08E-01 9.54E-01 1.01E 00 1.07E 00 1.13E 00 1.20E 00 1.25E 00
3 0.00562 2.86E-02 3.79E-01 7.74E-01 8.94E-01 9.32E-01 9.69E-01 1.01E 00 1.07E 00 1.12E 00 1.18E 00 1.24E 00 1.29E 00
2 0.00156 3.91E-02 4.86E-01 8.52E-01 9.39E-01 9.73E-01 1.01E 00 1.05E 00 1.11E 00 1.17E 00 1.22E 00 1.28E 00 1.33E 00
0      I =      14      15      16      17      18      19      20      21      22      23
      X = 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127
0 J      Y
21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
20 0.06187 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 5.00E-03
19 0.05937 3.03E-01 2.73E-01 2.40E-01 2.08E-01 1.80E-01 1.57E-01 1.42E-01 1.31E-01 1.52E-01 5.00E-03
18 0.05594 5.36E-01 5.02E-01 4.61E-01 4.17E-01 3.74E-01 3.38E-01 3.09E-01 2.87E-01 3.25E-01 5.00E-03
17 0.05344 6.53E-01 6.27E-01 5.89E-01 5.46E-01 5.04E-01 4.66E-01 4.35E-01 4.10E-01 4.49E-01 5.00E-03
16 0.05078 7.46E-01 7.29E-01 6.99E-01 6.61E-01 6.21E-01 5.85E-01 5.55E-01 5.31E-01 5.63E-01 5.00E-03
15 0.04812 8.18E-01 8.10E-01 7.87E-01 7.55E-01 7.19E-01 6.86E-01 6.58E-01 6.36E-01 6.57E-01 5.00E-03
14 0.04562 8.71E-01 8.71E-01 8.55E-01 8.28E-01 7.97E-01 7.67E-01 7.42E-01 7.21E-01 7.33E-01 5.00E-03
13 0.04328 9.13E-01 9.19E-01 9.09E-01 8.87E-01 8.59E-01 8.32E-01 8.09E-01 7.90E-01 7.93E-01 5.00E-03
12 0.04094 9.50E-01 9.61E-01 9.55E-01 9.37E-01 9.13E-01 8.89E-01 8.68E-01 8.50E-01 8.46E-01 5.00E-03
11 0.03719 1.00E 00 1.02E 00 1.02E 00 1.01E 00 9.86E-01 9.66E-01 9.47E-01 9.32E-01 9.19E-01 5.00E-03
10 0.03437 1.04E 00 1.06E 00 1.06E 00 1.05E 00 1.03E 00 1.02E 00 9.99E-01 9.85E-01 9.68E-01 5.00E-03
9 0.03219 1.06E 00 1.09E 00 1.09E 00 1.08E 00 1.07E 00 1.05E 00 1.04E 00 1.02E 00 1.00E 00 5.00E-03
8 0.03031 1.09E 00 1.11E 00 1.11E 00 1.11E 00 1.09E 00 1.08E 00 1.06E 00 1.05E 00 1.03E 00 5.00E-03
7 0.02687 1.12E 00 1.15E 00 1.16E 00 1.15E 00 1.14E 00 1.13E 00 1.11E 00 1.10E 00 1.08E 00 5.00E-03
6 0.02187 1.18E 00 1.21E 00 1.21E 00 1.21E 00 1.20E 00 1.19E 00 1.18E 00 1.17E 00 1.14E 00 5.00E-03
5 0.01625 1.24E 00 1.26E 00 1.27E 00 1.27E 00 1.26E 00 1.25E 00 1.24E 00 1.23E 00 1.21E 00 5.00E-03
4 0.01062 1.29E 00 1.31E 00 1.32E 00 1.32E 00 1.31E 00 1.30E 00 1.29E 00 1.28E 00 1.26E 00 5.00E-03
3 0.00562 1.33E 00 1.35E 00 1.36E 00 1.35E 00 1.34E 00 1.33E 00 1.32E 00 1.31E 00 1.30E 00 5.00E-03
2 0.00156 1.36E 00 1.38E 00 1.38E 00 1.37E 00 1.36E 00 1.34E 00 1.33E 00 1.32E 00 1.33E 00 5.00E-03
0*- - - - - DIMENSIONLESS EFF. VISCOSITY - - - - -
0      I =      1      2      3      4      5      6      7      8      9      10      11      12
      X = -0.03148 0.03148 0.09443 0.16430 0.24187 0.32796 0.42352 0.52960 0.64735 0.77804 0.92311 1.08415
0 J      Y
21 0.50500 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00
20 0.49500 1.00E 00 1.00E 00 1.00E 00 1.00E 00 2.32E 01 2.33E 01 2.12E 01 1.98E 01 1.98E 01 2.14E 01 2.30E 01 2.35E 01
19 0.47500 1.00E 00 1.00E 00 1.00E 00 1.00E 00 4.04E 02 4.95E 02 4.47E 02 4.13E 02 4.57E 02 5.94E 02 6.96E 02 7.02E 02

```


[illegible]

0- - - - -

Y-AXES ARE	00	02	04	06	08	10
SYMBOL	0	2	4	6	8	1
MAXIMUM VALUES	0.333E 00	0.381E 00	0.415E 00	0.444E 00	0.472E 00	0.500E 00

	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
X 0.00	0.00										0.00
X 0.02	0	2	4	6	8	1					0.02
X 0.04	.	0	2	4	6	8	1				0.04
X 0.06	.	.	0	2	4	6	8	1			0.06
X 0.08	.	.	.	0	2	4	6	8	1		0.08
X 0.10	+	.	.	.	0	2	4	6	8	1	0.10

156	0.2670E-01	0.1048E-01	0.1670E-01	0.5333E-02	0.2151E-02	0.4442E	08	0.6092E	01	0.3394E-02	0.1273E	02	0.1321E	04	0.1334E	04
157	0.2607E-01	0.1039E-01	0.1674E-01	0.5305E-02	0.2137E-02	0.4415E	08	0.6098E	01	0.3262E-02	0.1273E	02	0.1322E	04	0.1334E	04
158	0.2547E-01	0.1028E-01	0.1678E-01	0.5344E-02	0.2121E-02	0.4402E	08	0.6103E	01	0.3131E-02	0.1274E	02	0.1322E	04	0.1334E	04
159	0.2487E-01	0.1020E-01	0.1680E-01	0.5324E-02	0.2105E-02	0.4390E	08	0.6109E	01	0.2999E-02	0.1275E	02	0.1322E	04	0.1334E	04
160	0.2429E-01	0.1011E-01	0.1682E-01	0.5353E-02	0.2087E-02	0.4376E	08	0.6114E	01	0.2866E-02	0.1275E	02	0.1323E	04	0.1334E	04
161	0.2373E-01	0.1002E-01	0.1683E-01	0.5347E-02	0.2067E-02	0.4332E	08	0.6119E	01	0.2735E-02	0.1276E	02	0.1323E	04	0.1334E	04
162	0.2318E-01	0.9937E-02	0.1683E-01	0.5387E-02	0.2048E-02	0.4340E	08	0.6124E	01	0.2603E-02	0.1276E	02	0.1324E	04	0.1334E	04
163	0.2265E-01	0.9833E-02	0.1682E-01	0.5400E-02	0.2026E-02	0.4306E	08	0.6129E	01	0.2474E-02	0.1277E	02	0.1324E	04	0.1335E	04
164	0.2214E-01	0.9742E-02	0.1681E-01	0.5417E-02	0.2004E-02	0.4298E	08	0.6133E	01	0.2346E-02	0.1277E	02	0.1324E	04	0.1335E	04
165	0.2165E-01	0.9668E-02	0.1679E-01	0.5396E-02	0.1982E-02	0.4272E	08	0.6138E	01	0.2221E-02	0.1278E	02	0.1325E	04	0.1335E	04
166	0.2118E-01	0.9608E-02	0.1676E-01	0.5391E-02	0.1958E-02	0.4269E	08	0.6142E	01	0.2097E-02	0.1278E	02	0.1325E	04	0.1335E	04
167	0.2072E-01	0.9567E-02	0.1672E-01	0.5433E-02	0.1933E-02	0.4220E	08	0.6146E	01	0.1978E-02	0.1279E	02	0.1326E	04	0.1335E	04
168	0.2028E-01	0.9514E-02	0.1668E-01	0.5449E-02	0.1909E-02	0.4220E	08	0.6150E	01	0.1862E-02	0.1279E	02	0.1326E	04	0.1335E	04
169	0.1986E-01	0.9463E-02	0.1663E-01	0.5413E-02	0.1884E-02	0.4169E	08	0.6154E	01	0.1749E-02	0.1280E	02	0.1326E	04	0.1335E	04
170	0.1945E-01	0.9417E-02	0.1657E-01	0.5459E-02	0.1859E-02	0.4178E	08	0.6157E	01	0.1640E-02	0.1280E	02	0.1327E	04	0.1335E	04
171	0.1907E-01	0.9383E-02	0.1651E-01	0.5411E-02	0.1832E-02	0.4157E	08	0.6160E	01	0.1535E-02	0.1281E	02	0.1327E	04	0.1335E	04
172	0.1869E-01	0.9381E-02	0.1644E-01	0.5456E-02	0.1806E-02	0.4125E	08	0.6164E	01	0.1433E-02	0.1282E	02	0.1328E	04	0.1335E	04
173	0.1834E-01	0.9374E-02	0.1636E-01	0.5414E-02	0.1780E-02	0.4115E	08	0.6167E	01	0.1337E-02	0.1282E	02	0.1328E	04	0.1335E	04
174	0.1800E-01	0.9387E-02	0.1628E-01	0.5427E-02	0.1754E-02	0.4090E	08	0.6170E	01	0.1245E-02	0.1283E	02	0.1328E	04	0.1335E	04
175	0.1767E-01	0.9389E-02	0.1620E-01	0.5443E-02	0.1727E-02	0.4081E	08	0.6173E	01	0.1158E-02	0.1283E	02	0.1329E	04	0.1336E	04
176	0.1737E-01	0.9391E-02	0.1610E-01	0.5400E-02	0.1699E-02	0.4056E	08	0.6175E	01	0.1076E-02	0.1284E	02	0.1329E	04	0.1336E	04
177	0.1707E-01	0.9390E-02	0.1601E-01	0.5379E-02	0.1673E-02	0.4037E	08	0.6178E	01	0.9976E-03	0.1285E	02	0.1330E	04	0.1336E	04
178	0.1679E-01	0.9406E-02	0.1591E-01	0.5376E-02	0.1646E-02	0.4033E	08	0.6180E	01	0.9247E-03	0.1285E	02	0.1330E	04	0.1336E	04
179	0.1652E-01	0.9416E-02	0.1580E-01	0.5339E-02	0.1618E-02	0.4002E	08	0.6183E	01	0.8568E-03	0.1286E	02	0.1330E	04	0.1336E	04
180	0.1627E-01	0.9424E-02	0.1570E-01	0.5336E-02	0.1591E-02	0.3984E	08	0.6185E	01	0.7932E-03	0.1286E	02	0.1331E	04	0.1336E	04
181	0.1603E-01	0.9441E-02	0.1558E-01	0.5312E-02	0.1564E-02	0.3941E	08	0.6187E	01	0.7345E-03	0.1287E	02	0.1331E	04	0.1336E	04
182	0.1580E-01	0.9435E-02	0.1547E-01	0.5293E-02	0.1537E-02	0.3940E	08	0.6189E	01	0.6807E-03	0.1288E	02	0.1331E	04	0.1337E	04
183	0.1558E-01	0.9429E-02	0.1535E-01	0.5294E-02	0.1511E-02	0.3912E	08	0.6191E	01	0.6305E-03	0.1288E	02	0.1332E	04	0.1337E	04
184	0.1537E-01	0.9419E-02	0.1524E-01	0.5263E-02	0.1485E-02	0.3886E	08	0.6192E	01	0.5855E-03	0.1289E	02	0.1332E	04	0.1337E	04
185	0.1518E-01	0.9401E-02	0.1512E-01	0.5255E-02	0.1459E-02	0.3865E	08	0.6194E	01	0.5450E-03	0.1289E	02	0.1332E	04	0.1337E	04
186	0.1500E-01	0.9374E-02	0.1499E-01	0.5221E-02	0.1433E-02	0.3857E	08	0.6196E	01	0.5079E-03	0.1290E	02	0.1333E	04	0.1337E	04
187	0.1482E-01	0.9344E-02	0.1487E-01	0.5197E-02	0.1407E-02	0.3811E	08	0.6197E	01	0.4753E-03	0.1291E	02	0.1333E	04	0.1337E	04
188	0.1465E-01	0.9306E-02	0.1474E-01	0.5163E-02	0.1382E-02	0.3792E	08	0.6199E	01	0.4465E-03	0.1291E	02	0.1334E	04	0.1338E	04
189	0.1449E-01	0.9262E-02	0.1462E-01	0.5125E-02	0.1357E-02	0.3784E	08	0.6200E	01	0.4219E-03	0.1292E	02	0.1334E	04	0.1338E	04
190	0.1433E-01	0.9214E-02	0.1449E-01	0.5116E-02	0.1333E-02	0.3726E	08	0.6201E	01	0.4000E-03	0.1293E	02	0.1334E	04	0.1338E	04
191	0.1419E-01	0.9162E-02	0.1436E-01	0.5074E-02	0.1310E-02	0.3717E	08	0.6203E	01	0.3815E-03	0.1293E	02	0.1335E	04	0.1338E	04
192	0.1405E-01	0.9106E-02	0.1424E-01	0.5033E-02	0.1287E-02	0.3717E	08	0.6204E	01	0.3661E-03	0.1294E	02	0.1335E	04	0.1338E	04
193	0.1391E-01	0.9045E-02	0.1411E-01	0.5015E-02	0.1264E-02	0.3678E	08	0.6205E	01	0.3535E-03	0.1294E	02	0.1335E	04	0.1339E	04
194	0.1378E-01	0.8984E-02	0.1398E-01	0.5007E-02	0.1241E-02	0.3658E	08	0.6206E	01	0.3428E-03	0.1295E	02	0.1336E	04	0.1339E	04
195	0.1366E-01	0.8915E-02	0.1386E-01	0.4937E-02	0.1220E-02	0.3641E	08	0.6207E	01	0.3352E-03	0.1296E	02	0.1336E	04	0.1339E	04
196	0.1354E-01	0.8843E-02	0.1373E-01	0.4906E-02	0.1198E-02	0.3618E	08	0.6208E	01	0.3293E-03	0.1296E	02	0.1336E	04	0.1339E	04
197	0.1342E-01	0.8771E-02	0.1360E-01	0.4856E-02	0.1176E-02	0.3580E	08	0.6209E	01	0.3265E-03	0.1297E	02	0.1337E	04	0.1339E	04
198	0.1331E-01	0.8701E-02	0.1348E-01	0.4831E-02	0.1155E-02	0.3558E	08	0.6210E	01	0.3248E-03	0.1297E	02	0.1337E	04	0.1340E	04
199	0.1320E-01	0.8623E-02	0.1336E-01	0.4795E-02	0.1136E-02	0.3546E	08	0.6211E	01	0.3244E-03	0.1298E	02	0.1337E	04	0.1340E	04
200	0.1309E-01	0.8545E-02	0.1323E-01	0.4776E-02	0.1115E-02	0.3519E	08	0.6212E	01	0.3260E-03	0.1299E	02	0.1338E	04	0.1340E	04
0-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SWIRL CASE WITH LFS = 4
AND NSBR = 0

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 1.250

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 60.000

5	0.01625	4.49E 05	8.35E 04	4.53E 04	3.81E 04	7.41E 03	5.47E 03	5.41E 03	5.63E 03	5.77E 03	5.64E 03	5.18E 03	4.47E 03
4	0.01062	4.49E 05	8.99E 04	6.58E 04	1.19E 04	5.34E 03	4.63E 03	4.62E 03	4.80E 03	4.94E 03	4.88E 03	4.54E 03	3.96E 03
3	0.00562	4.49E 05	1.12E 05	6.01E 04	7.07E 03	4.50E 03	4.16E 03	4.18E 03	4.33E 03	4.45E 03	4.41E 03	4.14E 03	3.65E 03
2	0.00156	4.49E 05	1.54E 05	2.72E 04	5.63E 03	4.11E 03	3.93E 03	3.97E 03	4.11E 03	4.22E 03	4.19E 03	3.94E 03	3.48E 03
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127	
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	3.06E 03	2.99E 03	2.70E 03	2.36E 03	2.06E 03	1.82E 03	1.63E 03	1.48E 03	1.37E 03	1.34E 03	4.49E 05	
19	0.05937	2.82E 03	2.65E 03	2.29E 03	1.90E 03	1.55E 03	1.27E 03	1.06E 03	9.06E 02	7.92E 02	8.34E 02	4.49E 05	
18	0.05594	3.02E 03	2.66E 03	2.18E 03	1.72E 03	1.34E 03	1.04E 03	8.14E 02	6.58E 02	5.46E 02	6.16E 02	4.49E 05	
17	0.05344	3.28E 03	2.76E 03	2.19E 03	1.68E 03	1.27E 03	9.58E 02	7.33E 02	5.78E 02	4.68E 02	5.52E 02	4.49E 05	
16	0.05078	3.62E 03	2.92E 03	2.25E 03	1.69E 03	1.25E 03	9.20E 02	6.90E 02	5.35E 02	4.27E 02	5.20E 02	4.49E 05	
15	0.04812	3.94E 03	3.09E 03	2.32E 03	1.71E 03	1.24E 03	9.01E 02	6.68E 02	5.11E 02	4.04E 02	5.04E 02	4.49E 05	
14	0.04562	4.21E 03	3.23E 03	2.39E 03	1.73E 03	1.24E 03	8.93E 02	6.55E 02	4.98E 02	3.92E 02	4.93E 02	4.49E 05	
13	0.04328	4.41E 03	3.34E 03	2.44E 03	1.75E 03	1.24E 03	8.88E 02	6.48E 02	4.90E 02	3.84E 02	4.84E 02	4.49E 05	
12	0.04094	4.56E 03	3.41E 03	2.47E 03	1.76E 03	1.25E 03	8.84E 02	6.41E 02	4.83E 02	3.77E 02	4.74E 02	4.49E 05	
11	0.03719	4.68E 03	3.48E 03	2.50E 03	1.77E 03	1.24E 03	8.74E 02	6.31E 02	4.73E 02	3.68E 02	4.57E 02	4.49E 05	
10	0.03437	4.67E 03	3.47E 03	2.49E 03	1.75E 03	1.23E 03	8.63E 02	6.21E 02	4.65E 02	3.61E 02	4.41E 02	4.49E 05	
9	0.03219	4.62E 03	3.43E 03	2.46E 03	1.73E 03	1.21E 03	8.51E 02	6.12E 02	4.57E 02	3.55E 02	4.27E 02	4.49E 05	
8	0.03031	4.54E 03	3.38E 03	2.42E 03	1.71E 03	1.19E 03	8.38E 02	6.03E 02	4.50E 02	3.49E 02	4.14E 02	4.49E 05	
7	0.02687	4.36E 03	3.25E 03	2.34E 03	1.65E 03	1.16E 03	8.12E 02	5.84E 02	4.36E 02	3.37E 02	3.90E 02	4.49E 05	
6	0.02187	4.02E 03	3.02E 03	2.19E 03	1.55E 03	1.09E 03	7.68E 02	5.53E 02	4.13E 02	3.19E 02	3.53E 02	4.49E 05	
5	0.01625	3.61E 03	2.75E 03	2.00E 03	1.43E 03	1.01E 03	7.18E 02	5.19E 02	3.87E 02	2.99E 02	3.16E 02	4.49E 05	
4	0.01062	3.25E 03	2.51E 03	1.84E 03	1.32E 03	9.46E 02	6.75E 0						

3	0.04500	4.19E-02	3.63E-02	3.02E-02	2.44E-02	1.97E-02	1.58E-02	1.28E-02	1.05E-02	8.87E-03	8.86E-03	3.00E-02	
2	0.01250	4.16E-02	3.61E-02	3.01E-02	2.44E-02	1.96E-02	1.58E-02	1.28E-02	1.06E-02	8.90E-03	8.84E-03	3.00E-02	
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	DIMENSIONLESS LENGTH SCALE										DIMENSIONLESS EFF. VISCOSITY		
0	I =	2	3	4	5	6	7	8	9	10	11	12	
0	X =	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552	0.15786
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	2.05E-01	1.99E-01	1.92E-01	1.90E-01	2.14E-01	2.80E-01	3.24E-01	3.32E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	1.88E-01	1.91E-01	1.98E-01	2.21E-01	3.05E-01	4.38E-01	5.25E-01	5.55E-01
17	0.05344	0.00	0.00	5.10E-02	1.23E-01	1.46E-01	1.70E-01	1.96E-01	2.51E-01	3.73E-01	5.10E-01	6.06E-01	6.51E-01
16	0.05078	0.00	0.00	1.78E-01	1.59E-01	1.62E-01	1.77E-01	2.15E-01	3.09E-01	4.41E-01	5.67E-01	6.63E-01	7.20E-01
15	0.04812	0.00	0.00	1.78E-01	1.42E-01	1.53E-01	1.87E-01	2.62E-01	3.77E-01	4.99E-01	6.12E-01	7.06E-01	7.71E-01
14	0.04562	0.00	5.10E-02	9.40E-02	1.17E-01	1.54E-01	2.21E-01	3.24E-01	4.36E-01	5.44E-01	6.48E-01	7.40E-01	8.08E-01
13	0.04328	0.00	1.60E-01	1.11E-01	1.24E-01	1.81E-01	2.74E-01	3.81E-01	4.83E-01	5.82E-01	6.80E-01	7.69E-01	8.39E-01
12	0.04094	0.00	1.60E-01	8.87E-02	1.24E-01	2.11E-01	3.29E-01	4.32E-01	5.25E-01	6.17E-01	7.10E-01	7.97E-01	8.67E-01
11	0.03719	7.64E-02	6.28E-02	6.39E-02	1.33E-01	2.74E-01	4.15E-01	5.04E-01	5.85E-01	6.70E-01	7.57E-01	8.40E-01	9.10E-01
10	0.03437	1.60E-01	5.52E-02	6.04E-02	1.60E-01	3.41E-01	4.71E-01	5.49E-01	6.26E-01	7.08E-01	7.92E-01	8.72E-01	9.41E-01
9	0.03219	1.60E-01	2.76E-02	5.87E-02	1.92E-01	3.94E-01	5.11E-01	5.84E-01	6.58E-01	7.37E-01	8.18E-01	8.97E-01	9.64E-01
8	0.03031	5.30E-03	9.47E-03	6.36E-02	2.23E-01	4.40E-01	5.47E-01	6.15E-01	6.85E-01	7.62E-01	8.41E-01	9.18E-01	9.85E-01
7	0.02687	5.31E-03	1.17E-02	8.18E-02	2.86E-01	5.23E-01	6.10E-01	6.71E-01	7.36E-01	8.08E-01	8.83E-01	9.58E-01	1.02E 00
6	0.02187	5.35E-03	1.79E-02	1.22E-01	4.44E-01	6.30E-01	6.98E-01	7.51E-01	8.10E-01	8.75E-01	9.44E-01	1.01E 00	1.08E 00
5	0.01625	5.50E-03	3.49E-02	2.09E-01	5.77E-01	7.36E-01	7.91E-01	8.37E-01	8.89E-01	9.48E-01	1.01E 00	1.07E 00	1.13E 00
4	0.01062	6.18E-03	8.15E-02	3.45E-01	7.11E-01	8.27E-01	8.73E-01	9.15E-01	9.62E-01	1.01E 00	1.07E 00	1.13E 00	1.19E 00
3	0.00562	9.35E-03	3.17E-01	5.17E-01	8.07E-01	8.92E-01	9.33E-01	9.73E-01	1.02E 00	1.07E 00	1.12E 00	1.18E 00	1.23E 00
2	0.00156</												

49	0.2517E	00	0.1532E	00	0.1053E	00	0.4535E-01	0.4483E-01	0.7754E	09	0.6226E	01-0.1070E-02	0.1321E	02	0.1496E	04	0.1361E	04
50	0.2479E	00	0.1504E	00	0.1049E	00	0.4639E-01	0.4476E-01	0.7305E	09	0.6225E	01-0.1232E-02	0.1321E	02	0.1496E	04	0.1363E	04
51	0.2438E	00	0.1477E	00	0.1045E	00	0.4744E-01	0.4462E-01	0.6817E	09	0.6224E	01-0.1404E-02	0.1322E	02	0.1496E	04	0.1365E	04
52	0.2395E	00	0.1456E	00	0.1041E	00	0.4848E-01	0.4438E-01	0.6309E	09	0.6222E	01-0.1588E-02	0.1322E	02	0.1495E	04	0.1367E	04
53	0.2360E	00	0.1439E	00	0.1039E	00	0.4953E-01	0.4405E-01	0.5876E	09	0.6221E	01-0.1784E-02	0.1323E	02	0.1495E	04	0.1369E	04
54	0.2326E	00	0.1421E	00	0.1034E	00	0.5060E-01	0.4365E-01	0.5489E	09	0.6219E	01-0.1989E-02	0.1324E	02	0.1495E	04	0.1372E	04
55	0.2292E	00	0.1406E	00	0.1029E	00	0.5172E-01	0.4320E-01	0.5094E	09	0.6216E	01-0.2207E-02	0.1324E	02	0.1494E	04	0.1375E	04
56	0.2256E	00	0.1395E	00	0.1025E	00	0.5282E-01	0.4271E-01	0.4693E	09	0.6214E	01-0.2435E-02	0.1325E	02	0.1494E	04	0.1377E	04
57	0.2222E	00	0.1386E	00	0.1019E	00	0.5399E-01	0.4219E-01	0.4289E	09	0.6211E	01-0.2675E-02	0.1326E	02	0.1494E	04	0.1381E	04
58	0.2191E	00	0.1376E	00	0.1015E	00	0.5507E-01	0.4163E-01	0.3938E	09	0.6208E	01-0.2924E-02	0.1326E	02	0.1494E	04	0.1384E	04
59	0.2163E	00	0.1368E	00	0.1011E	00	0.5612E-01	0.4109E-01	0.3708E	09	0.6204E	01-0.3183E-02	0.1327E	02	0.1494E	04	0.1387E	04
60	0.2136E	00	0.1359E	00	0.1006E	00	0.5714E-01	0.4051E-01	0.3519E	09	0.6200E	01-0.3452E-02	0.1328E	02	0.1494E	04	0.1391E	04
61	0.2111E	00	0.1351E	00	0.9987E-01	0.5813E-01	0.3987E-01	0.3346E	09	0.6196E	01-0.3729E-02	0.1329E	02	0.1494E	04	0.1395E	04	
62	0.2087E	00	0.1346E	00	0.9899E-01	0.5904E-01	0.3918E-01	0.3158E	09	0.6191E	01-0.4014E-02	0.1330E	02	0.1494E	04	0.1399E	04	
63	0.2061E	00	0.1342E	00	0.9814E-01	0.5991E-01	0.3847E-01	0.2980E	09	0.6186E	01-0.4307E-02	0.1331E	02	0.1494E	04	0.1404E	04	
64	0.2034E	00	0.1338E	00	0.9723E-01	0.6084E-01	0.3773E-01	0.2819E	09	0.6180E	01-0.4608E-02	0.1332E	02	0.1494E	04	0.1409E	04	
65	0.2015E	00	0.1334E	00	0.9655E-01	0.6161E-01	0.3696E-01	0.2655E	09	0.6174E	01-0.4914E-02	0.1333E	02	0.1494E	04	0.1414E	04	
66	0.1999E	00	0.1330E	00	0.9588E-01	0.6230E-01	0.3616E-01	0.2504E	09	0.6168E	01-0.5225E-02	0.1334E	02	0.1494E	04	0.1419E	04	
67	0.1979E	00	0.1327E	00	0.9507E-01	0.6290E-01	0.3534E-01	0.2382E	09	0.6161E	01-0.5540E-02	0.1335E	02	0.1494E	04	0.1425E	04	
68	0.1955E	00	0.1323E	00	0.9412E-01	0.6347E-01	0.3449E-01	0.2257E	09	0.6154E	01-0.5857E-02	0.1336E	02	0.1494E	04	0.1431E	04	
69	0.1933E	00	0.1318E	00	0.9299E-01	0.6385E-01	0.3365E-01	0.2204E	09	0.6146E	01-0.6177E-02	0.1337E	02	0.1494E	04	0.1437E	04	
70	0.1910E	00	0.1311E	00	0.9176E-01	0.6425E-01	0.3279E-01	0.2152E	09	0.6137E	01-0.6496E-02	0.1338E	02	0.1494E	04	0.1444E	04	
71	0.1887E	00	0.1306E	00	0.9041E-01	0.6451E-01	0.3194E-01	0.2110E	09	0.6129E	01-0.6814E-02	0.1340E	02	0.1495E	04	0.1450E	04	
72	0.1867E	00	0.1303E	00	0.8907E-01	0.6467E-01	0.3108E-01	0.2066E	09	0.6119E	01-0.7130E-02	0.1341E	02	0.1495E	04	0.1457E	04	
73	0.1848E	00	0.1302E	00	0.8796E-01	0.6476E-01	0.3022E-01	0.2007E	09	0.6110E	01-0.7440E-02	0.1342E	02	0.1495E	04	0.1465E	04	
74	0.1831E	00	0.1298E	00	0.8680E-01	0.6471E-01	0.2936E-01	0.1953E	09	0.6099E	01-0.7744E-02	0.1344E	02	0.1496E	04	0.1472E	04	
75	0.1810E	00	0.1291E	00	0.8553E-01	0.6464E-01	0.2850E-01	0.1907E	09	0.6089E	01-0.8041E-02	0.1346E	02	0.1496E	04	0.1480E	04	
76	0.1786E	00	0.1283E	00	0.8415E-01	0.6439E-01	0.2765E-01	0.1853E	09	0.6077E	01-0.8328E-02	0.1347E	02	0.1496E	04	0.1488E	04	
77	0.1761E	00	0.1273E	00	0.8265E-01	0.6413E-01	0.2680E-01	0.1793E	09	0.6066E	01-0.8604E-02	0.1349E	02	0.1497E	04	0.1497E	04	
78	0.1741E	00	0.1261E	00	0.8110E-01	0.6367E-01	0.2595E-01	0.1727E	09	0.6054E	01-0.8867E-02	0.1351E	02	0.1497E	04	0.1506E	04	
79	0.1722E	00	0.1247E	00	0.7944E-01	0.6315E-01	0.2511E-01	0.1650E	09	0.6041E	01-0.9115E-02	0.1352E	02	0.1498E	04	0.1514E	04	
80	0.1704E	00	0.1234E	00	0.7769E-01	0.6258E-01	0.2429E-01	0.1572E	09	0.6028E	01-0.9346E-02	0.1354E	02	0.1498E	04	0.1524E	04	
81	0.1682E	00	0.1220E	00	0.7598E-01	0.6189E-01	0.2347E-01	0.1491E	09	0.6015E	01-0.9559E-02	0.1356E	02	0.1499E	04	0.1533E	04	
82	0.1663E	00	0.1212E	00	0.7447E-01	0.6112E-01	0.2266E-01	0.1404E	09	0.6001E	01-0.9753E-02	0.1358E	02	0.1500E	04	0.1542E	04	
83	0.1641E	00	0.1201E	00	0.7287E-01	0.6028E-01	0.2187E-01	0.1318E	09	0.5987E	01-0.9925E-02	0.1360E	02	0.1500E	04	0.1552E	04	
84	0.1617E	00	0.1187E	00	0.7122E-01	0.5935E-01	0.2109E-01	0.1243E	09	0.5972E	01-0.1008E-01	0.1362E	02	0.1501E	04	0.1562E	04	
85	0.1595E	00	0.1172E	00	0.6952E-01	0.5835E-01	0.2032E-01	0.1182E	09	0.5958E	01-0.1020E-01	0.1364E	02	0.1502E	04	0.1572E	04	
86	0.1577E	00	0.1154E	00	0.6782E-01	0.5729E-01	0.1958E-01	0.1118E	09	0.5943E	01-0.1030E-01	0.1366E	02	0.1502E	04	0.1582E	04	
87	0.1560E	00	0.1134E	00	0.6606E-01	0.5613E-01	0.1887E-01	0.1061E	09	0.5927E	01-0.1038E-01	0.1369E	02	0.1503E	04	0.1592E	04	
88	0.1540E	00	0.1112E	00	0.6426E-01	0.5496E-01	0.1823E-01	0.1006E	09	0.5912E	01-0.1042E-01	0.1371E	02	0.1504E	04	0.1602E	04	
89	0.1518E	00	0.1089E	00	0.6245E-01	0.5374E-01	0.1761E-01	0.9514E	08	0.5896E	01-0.1044E-01	0.1373E	02	0.1505E	04	0.1613E	04	
90	0.1497E	00	0.1066E	00	0.6065E-01	0.5248E-01	0.1700E-01	0.8964E	08	0.5880E	01-0.1043E-01	0.1376E	02	0.1505E	04	0.1623E	04	
91	0.1475E	00	0.1042E	00	0.5892E-01	0.5115E-01	0.1644E-01	0.8415E	08	0.5864E	01-0.1040E-01	0.1378E	02	0.1506E	04	0.1633E	04	
92	0.1453E	00	0.1019E	00	0.5727E-01	0.4982E-01	0.1597E-01	0.7962E	08	0.5848E	01-0.1033E-01	0.1380E	02	0.1507E	04	0.1644E	04	
93	0.1432E	00	0.9998E-01	0.5559E-01	0.4848E-01	0.1550E-01	0.7606E	08	0.5832E	01-0.1024E-01	0.1383E	02	0.1508E	04	0.1654E	04		
94	0.1415E	00	0.9795E-01	0.5390E-01	0.4706E-01	0.1506E-01	0.7382E	08	0.5816E	01-0.1011E-01	0.1385E	02	0.1509E	04	0.1664E	04		
95	0.1397E	00	0.9576E-01	0.5219E-01	0.4568E-01	0.1463E-01	0.7197E	08	0.5800E	01-0.9961E-02	0.1388E	02	0.1510E	04	0.1674E	04		
96	0.1377E	00	0.9345E-01	0.5051E-01	0.4431E-01	0.1420E-01	0.6986E	08	0.5784E	01-0.9783E-02	0.1390E	02	0.1510E	04	0.1684E	04		
97	0.1357E	00	0.9101E-01	0.4881E-01	0.4287E-01	0.1382E-01	0.6899E	08	0.5768E	01-0.9578E-02	0.1393E	02	0.1511E	04	0.1694E	04		
98	0.1337E	00	0.8844E-01	0.4715E-01	0.4150E-01	0.1352E-01	0.6834E	08	0.5752E	01-0.9348E-02	0.1395E	02	0.1512E	04	0.1704E	04		
99	0.1317E	00	0.8576E-01	0.4557E-01	0.4008E-01	0.1323E-01	0.6762E	08	0.5737E	01-0.9095E-02	0.1398E	02	0.1513E	04	0.1714E	04		
100	0.1297E	00	0.8303E-01	0.4399E-01	0.3867E-01	0.1296E-01	0.6693E	08	0.5721E	01-0.8817E-02	0.1400E	02	0.1514E	04	0.1724E	04		
101	0.1278E	00	0.8026E-01	0.4249E-01	0.3728E-01	0.1268E-01	0.6700E	08	0.5706E	01-0.8519E-02	0.1403E	02	0.1515E	04	0.1733E	04		
102	0.1260E	00	0.7746E-01	0.4104E-01	0.3592E-01	0.1238E-01	0.6751E	08	0.5692E	01-0.8200E-02	0.1405E	02	0.1516E	04	0.1742E	04		

14	0.04562	0.00	0.00	-9.24E-02	4.40E-02	6.25E-02	8.77E-02	9.10E-02	7.72E-02	5.88E-02	4.29E-02	2.82E-02	1.80E-02
13	0.04328	0.00	0.00	-7.02E-02	1.35E-02	5.81E-02	8.36E-02	8.22E-02	6.60E-02	4.62E-02	2.95E-02	1.42E-02	2.72E-03
12	0.04094	0.00	0.00	-3.99E-02	-1.39E-03	4.86E-02	7.25E-02	6.89E-02	5.15E-02	3.13E-02	1.43E-02	-1.11E-03	-1.33E-02
11	0.03719	0.00	-1.28E-01	-5.38E-02	-1.84E-02	3.00E-02	4.44E-02	3.87E-02	2.18E-02	3.03E-03	-1.30E-02	-2.74E-02	-4.04E-02
10	0.03437	0.00	-1.18E-01	-8.13E-02	-3.81E-02	4.51E-03	1.38E-02	1.05E-02	-4.80E-03	-2.19E-02	-3.63E-02	-4.93E-02	-6.16E-02
9	0.03219	0.00	-1.10E-01	-9.65E-02	-5.62E-02	-2.09E-02	-1.12E-02	-1.42E-02	-2.77E-02	-4.25E-02	-5.58E-02	-6.78E-02	-7.89E-02
8	0.03031	0.00	-1.14E-01	-1.08E-01	-7.68E-02	-4.70E-02	-3.46E-02	-3.67E-02	-4.83E-02	-6.10E-02	-7.31E-02	-8.38E-02	-9.40E-02
7	0.02687	0.00	-1.42E-01	-1.40E-01	-1.19E-01	-8.99E-02	-8.02E-02	-8.13E-02	-8.81E-02	-9.65E-02	-1.05E-01	-1.13E-01	-1.21E-01
6	0.02187	0.00	-1.92E-01	-1.94E-01	-1.70E-01	-1.55E-01	-1.51E-01	-1.48E-01	-1.47E-01	-1.48E-01	-1.49E-01	-1.52E-01	-1.57E-01
5	0.01625	0.00	-2.50E-01	-2.48E-01	-2.48E-01	-2.37E-01	-2.27E-01	-2.18E-01	-2.09E-01	-2.00E-01	-1.94E-01	-1.91E-01	-1.91E-01
4	0.01062	0.00	-3.11E-01	-3.09E-01	-3.20E-01	-3.07E-01	-2.91E-01	-2.74E-01	-2.57E-01	-2.42E-01	-2.29E-01	-2.20E-01	-2.16E-01
3	0.00562	0.00	-3.57E-01	-3.58E-01	-3.62E-01	-3.50E-01	-3.29E-01	-3.07E-01	-2.86E-01	-2.66E-01	-2.49E-01	-2.38E-01	-2.31E-01
2	0.00156	0.00	-3.80E-01	-3.81E-01	-3.79E-01	-3.67E-01	-3.44E-01	-3.19E-01	-2.97E-01	-2.76E-01	-2.57E-01	-2.44E-01	-2.36E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.13E-01	1.15E-01	1.17E-01	1.20E-01	1.26E-01	1.34E-01	1.42E-01	1.45E-01	1.46E-01	1.47E-01	0.00	0.00
19	0.05937	9.80E-02	9.84E-02	1.00E-01	1.03E-01	1.10E-01	1.19E-01	1.27E-01	1.31E-01	1.32E-01	1.34E-01	0.00	0.00
18	0.05594	7.62E-02	7.43E-02	7.50E-02	7.77E-02	8.39E-02	9.17E-02	9.89E-02	1.03E-01	1.04E-01	1.05E-01	0.00	0.00
17	0.05344	6.01E-02	5.61E-02	5.64E-02	5.85E-02	6.37E-02	7.04E-02	7.64E-02	7.93E-02	7.99E-02	8.03E-02	0.00	0.00
16	0.05078	4.29E-02	3.71E-02	3.63E-02	3.78E-02	4.18E-02	4.71E-02	5.15E-02	5.33E-02	5.33E-02	5.31E-02	0.00	0.00
15	0.04812	2.52E-02	1.76E-02	1.60E-02	1.69E-02	1.97E-02	2.31E-02	2.60E-02	2.66E-02	2.61E-02	2.55E-02	0.00	0.00
14	0.04562	8.17E-03	-8.06E-04	-3.05E-03	-2.51E-03	-1.12E-03	3.35E-04	1.69E-03	1.25E-03	1.16E-04	-1.87E-04	0.00	0.00
13	0.04328	-8.14E-03	-1.79E-02	-2.09E-02	-2.09E-02	-2.07E-02	-2.08E-02	-2.12E-02	-2.24E-02	-2.40E-02	-2.39E-02	0.00	0.00
12	0.04094	-2.47E-02	-3.50E-02	-3.85E-02	-3.89E-02	-4.03E-02	-4.20E-02	-4.39E-02	-4.62E-02	-4.78E-02	-4.72E-02	0.00	0.00
11	0.03719	-5.22E-02	-6.22E-02	-6.58E-02	-6.74E-02	-7.07E-02	-7.55E-02	-8.00E-02	-8.33E-02	-8.48E-02	-8.34E-02	0.00	0.00
10	0.03437	-7.33E-02	-8.26E-02	-8.61E-02	-8.83E-02	-9.30E-02	-9.99E-02	-1.06E-01	-1.10E-01	-1.11E-01	-1.09E-01	0.00	0.00
9	0.03219	-8.99E-02	-9.81E-02	-1.02E-01	-1.04E-01	-1.10E-01	-1.18E-01	-1.26E-01	-1.30E-01	-1.31E-01	-1.27E-01	0.00	0.00
8	0.03031	-1.04E-01	-1.11E-01	-1.15E-01	-1.18E-01	-1.24E-01	-1.33E-01	-1.41E-01	-1.46E-01	-1.47E-01	-1.43E-01	0.00	0.00
7	0.02687	-1.29E-01	-1.34E-01	-1.38E-01	-1.41E-01	-1.49E-01	-1.60E-01	-1.69E-01	-1.75E-01	-1.75E-01	-1.69E-01	0.00	0.00
6	0.02187	-1.61E-01	-1.65E-01	-1.67E-01	-1.71E-01	-1.81E-01	-1.94E-01	-2.05E-01	-2.10E-01	-2.09E-01	-2.03E-01	0.00	0.00
5	0.01625	-1.93E-01	-1.93E-01	-1.95E-01	-2.00E-01	-2.11E-01	-2.26E-01	-2.38E-01	-2.42E-01	-2.40E-01	-2.33E-01	0.00	0.00
4	0.01062	-2.16E-01	-2.14E-01	-2.15E-01	-2.21E-01	-2.33E-01	-2.49E-01	-2.61E-01	-2.65E-01	-2.62E-01	-2.54E-01	0.00	0.00
3	0.00562	-2.28E-01	-2.27E-01	-2.27E-01	-2.33E-01	-2.46E-01	-2.62E-01	-2.74E-01	-2.77E-01	-2.74E-01	-2.66E-01	0.00	0.00
2	0.00156	-2.33E-01	-2.31E-01	-2.31E-01	-2.38E-01	-2.50E-01	-2.66E-01	-2.78E-01	-2.82E-01	-2.78E-01	-2.70E-01	0.00	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	*****												
	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	4.38E 00	4.07E 00	3.28E 00	2.76E 00	2.54E 00	2.80E 00	3.42E 00	3.83E 00
19	0.05937	0.00	0.00	0.00	0.00	2.46E 01	2.68E 01	2.10E 01	1.63E 01	1.39E 01	1.54E 01	1.90E 01	2.09E 01
18	0.05594	0.00	0.00	0.00	0.00	3.89E 01	3.15E 01	2.48E 01	2.05E 01	2.01E 01	2.47E 01	2.98E 01	3.13E 01
17	0.05344	0.00	0.00	0.00	1.29E 01	2.64E 01	2.48E 01	2.29E 01	2.25E 01	2.61E 01	3.24E 01	3.68E 01	3.72E 01
16	0.05078	0.00	0.00	0.00	4.50E 01	3.28E 01	2.71E 01	2.54E 01	2.83E 01	3.50E 01	4.12E 01	4.40E 01	4.28E 01
15	0.04812	0.00	0.00	0.00	4.28E 01	3.05E 01	2.78E 01	3.04E 01	3.76E 01	4.50E 01	4.96E 01	5.05E 01	4.78E 01
14	0.04562	0.00	0.00	1.88E 01	2.67E 01	2.78E 01	3.11E 01	3.87E 01	4.77E 01	5.39E 01	5.65E 01	5.58E 01	5.19E 01
13	0.04328	0.00	0.00	5.15E 01	3.06E 01	3.11E 01	3.78E 01	4.77E 01	5.62E 01	6.08E 01	6.19E 01	5.99E 01	5.50E 01
12	0.04094	0.00	0.00	3.49E 01	2.50E 01	3.40E 01	4.45E 01	5.53E 01	6.27E 01	6.60E 01	6.60E 01	6.32E 01	5.76E 01
11	0.03719	0.00	2.46E 01	1.97E 01	2.37E 01	4.24E 01	5.55E 01	6.40E 01	6.95E 01	7.14E 01	7.05E 01	6.70E 01	6.06E 01
10	0.03437	0.00	5.40E 01	1.95E 01	2.80E 01	5.47E 01	5.90E 01	6.59E 01	7.11E 01	7.31E 01	7.22E 01	6.85E 01	6.19E 01

0	J	Y															
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	6.13E 05	6.15E 05	6.15E 05	6.13E 05	6.11E 05	6.07E 05	6.03E 05	5.99E 05	5.95E 05	5.91E 05	5.87E 05	5.83E 05	5.79E 05	5.75E 05	5.71E 05	5.67E 05
19	0.47500	6.01E 05	6.01E 05	6.00E 05	5.98E 05	5.96E 05	5.93E 05	5.89E 05	5.86E 05	5.82E 05	5.78E 05	5.74E 05	5.70E 05	5.66E 05	5.62E 05	5.58E 05	5.54E 05
18	0.44750	5.82E 05	5.81E 05	5.79E 05	5.77E 05	5.74E 05	5.71E 05	5.68E 05	5.65E 05	5.62E 05	5.59E 05	5.55E 05	5.52E 05	5.48E 05	5.45E 05	5.41E 05	5.38E 05
17	0.42750	5.67E 05	5.66E 05	5.63E 05	5.61E 05	5.58E 05	5.56E 05	5.53E 05	5.50E 05	5.48E 05	5.46E 05	5.44E 05	5.42E 05	5.40E 05	5.37E 05	5.35E 05	5.33E 05
16	0.40625	5.52E 05	5.49E 05	5.47E 05	5.44E 05	5.42E 05	5.40E 05	5.37E 05	5.35E 05	5.33E 05	5.31E 05	5.29E 05	5.27E 05	5.25E 05	5.23E 05	5.21E 05	5.19E 05
15	0.38500	5.35E 05	5.33E 05	5.30E 05	5.28E 05	5.26E 05	5.24E 05	5.22E 05	5.20E 05	5.19E 05	5.17E 05	5.15E 05	5.13E 05	5.11E 05	5.09E 05	5.07E 05	5.05E 05
14	0.36500	5.20E 05	5.17E 05	5.15E 05	5.13E 05	5.11E 05	5.09E 05	5.08E 05	5.07E 05	5.06E 05	5.05E 05	5.04E 05	5.03E 05	5.02E 05	5.01E 05	5.00E 05	4.99E 05
13	0.34625	5.05E 05	5.02E 05	5.00E 05	4.99E 05	4.97E 05	4.96E 05	4.95E 05	4.95E 05	4.94E 05	4.94E 05	4.94E 05	4.93E 05	4.93E 05	4.93E 05	4.92E 05	4.92E 05
12	0.32750	4.90E 05	4.88E 05	4.86E 05	4.85E 05	4.84E 05	4.84E 05	4.83E 05	4.83E 05	4.83E 05	4.83E 05	4.83E 05	4.82E 05	4.82E 05	4.82E 05	4.82E 05	4.81E 05
11	0.29750	4.65E 05	4.65E 05	4.64E 05	4.64E 05	4.64E 05	4.65E 05	4.65E 05	4.65E 05	4.66E 05	4.66E 05	4.67E 05	4.67E 05	4.67E 05	4.67E 05	4.67E 05	4.67E 05
10	0.27500	4.47E 05	4.48E 05	4.49E 05	4.49E 05	4.50E 05	4.51E 05	4.53E 05	4.54E 05	4.55E 05	4.56E 05	4.57E 05	4.58E 05	4.59E 05	4.60E 05	4.61E 05	4.62E 05
9	0.25750	4.33E 05	4.35E 05	4.37E 05	4.38E 05	4.40E 05	4.42E 05	4.43E 05	4.45E 05	4.46E 05	4.48E 05	4.49E 05	4.50E 05	4.51E 05	4.52E 05	4.53E 05	4.54E 05
8	0.24250	4.21E 05	4.24E 05	4.27E 05	4.29E 05	4.32E 05	4.34E 05	4.36E 05	4.38E 05	4.40E 05	4.42E 05	4.44E 05	4.46E 05	4.48E 05	4.50E 05	4.52E 05	4.54E 05

[illegible]

O	J	Y	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	0.00	4.83E-01	4.83E-01	4.82E-01	4.81E-01	4.79E-01	4.79E-01	4.88E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	5.01E-01	4.97E-01	4.97E-01	4.99E-01	5.01E-01	5.06E-01	5.23E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	5.18E-01	5.05E-01	5.01E-01	5.03E-01	5.07E-01	5.19E-01	5.45E-01
17	0.42750	0.00	0.00	0.00	0.00	5.85E-01	5.43E-01	5.18E-01	5.09E-01	5.09E-01	5.15E-01	5.35E-01	5.64E-01
16	0.40625	0.00	0.00	0.00	0.00	6.06E-01	5.52E-01	5.19E-01	5.12E-01	5.15E-01	5.29E-01	5.57E-01	5.83E-01

COMPUTED INLET SWIRL NUMBER = 1.1566

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

```
0*- - - - - U VELOCITY - - - - -
0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = 0.00000 0.00000 0.00787 0.01617 0.02539 0.03561 0.04697 0.05957 0.07356 0.08909 0.10632 0.12545
0 J Y
21 0.06312 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06187 0.00 0.00 0.00 0.00 0.00 8.12E 00 1.37E 01 1.47E 01 1.40E 01 1.31E 01 1.22E 01 1.15E 01
19 0.05937 0.00 0.00 0.00 0.00 0.00 1.10E 01 1.53E 01 1.60E 01 1.53E 01 1.42E 01 1.31E 01 1.21E 01
18 0.05594 0.00 0.00 0.00 0.00 0.00 1.40E 01 1.69E 01 1.70E 01 1.59E 01 1.46E 01 1.32E 01 1.20E 01
17 0.05344 0.00 0.00 0.00 0.00 1.89E 01 1.67E 01 1.76E 01 1.71E 01 1.57E 01 1.41E 01 1.27E 01 1.16E 01
16 0.05078 0.00 0.00 0.00 0.00 1.63E 01 1.62E 01 1.65E 01 1.58E 01 1.44E 01 1.30E 01 1.19E 01 1.11E 01
15 0.04812 0.00 0.00 0.00 0.00 1.61E 01 1.58E 01 1.50E 01 1.37E 01 1.24E 01 1.15E 01 1.09E 01 1.03E 01
14 0.04562 0.00 0.00 0.00 2.22E 01 1.73E 01 1.50E 01 1.29E 01 1.12E 01 1.03E 01 9.98E 00 9.79E 00 9.56E 00
13 0.04328 0.00 0.00 0.00 1.73E 01 1.58E 01 1.31E 01 1.03E 01 8.66E 00 8.39E 00 8.59E 00 8.75E 00 8.76E 00
12 0.04094 0.00 0.00 0.00 1.57E 01 1.49E 01 1.12E 01 7.61E 00 6.29E 00 6.61E 00 7.24E 00 7.69E 00 7.92E 00
11 0.03719 0.00 0.00 1.80E 01 1.62E 01 1.37E 01 8.20E 00 3.35E 00 3.01E 00 4.12E 00 5.21E 00 5.99E 00 6.50E 00
10 0.03437 0.00 0.00 1.66E 01 1.65E 01 1.20E 01 3.95E 00 4.87E -01 1.07E 00 2.48E 00 3.77E 00 4.72E 00 5.41E 00
9 0.03219 0.00 0.00 1.88E 01 1.68E 01 1.03E 01 1.33E 00 -1.18E 00 -2.16E -01 1.32E 00 2.68E 00 3.74E 00 4.55E 00
8 0.03031 0.00 3.00E 01 2.21E 01 1.67E 01 8.38E 00 -6.11E -01 -2.32E 00 -1.19E 00 3.76E -01 1.78E 00 2.91E 00 3.83E 00
7 0.02687 0.00 3.00E 01 2.34E 01 1.56E 01 5.15E 00 -3.61E 00 -3.93E 00 -2.72E 00 -1.21E 00 2.11E -01 1.44E 00 2.51E 00
6 0.02187 0.00 3.00E 01 2.36E 01 1.28E 01 -1.93E 00 -6.12E 00 -5.67E 00 -4.58E 00 -3.24E 00 -1.87E 00 -5.54E -01 7.07E -01
5 0.01625 0.00 3.00E 01 2.14E 01 5.24E 00 -9.80E 00 -8.29E 00 -7.29E 00 -6.29E 00 -5.14E 00 -3.85E 00 -2.47E 00 -1.05E 00
4 0.01062 0.00 3.00E 01 1.54E 01 -9.88E 00 -1.10E 01 -9.75E 00 -8.57E 00 -7.58E 00 -6.54E 00 -5.33E 00 -3.91E 00 -2.39E 00
3 0.00562 0.00 3.00E 01 -1.09E 00 -1.39E 01 -1.20E 01 -1.06E 01 -9.32E 00 -8.30E 00 -7.31E 00 -6.14E 00 -4.72E 00 -3.12E 00
2 0.00156 0.00 3.00E 01 -1.71E 01 -1.54E 01 -1.24E 01 -1.09E 01 -9.59E 00 -8.56E 00 -7.59E 00 -6.43E 00 -5.02E 00 -3.39E 00
1 -0.00156 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 0.14669 0.17026 0.19643 0.22547 0.25771 0.29349 0.33321 0.37500 0.41679 0.45858 0.50037
0 J Y
21 0.06312 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06187 1.07E 01 1.01E 01 9.56E 00 9.22E 00 9.03E 00 8.92E 00 8.84E 00 8.80E 00 8.78E 00 8.79E 00 8.80E 00
19 0.05937 1.11E 01 1.04E 01 9.87E 00 9.54E 00 9.35E 00 9.25E 00 9.22E 00 9.23E 00 9.28E 00 9.33E 00 9.33E 00
18 0.05594 1.11E 01 1.03E 01 9.83E 00 9.49E 00 9.28E 00 9.15E 00 9.09E 00 9.08E 00 9.09E 00 9.12E 00 9.13E 00
17 0.05344 1.08E 01 1.02E 01 9.68E 00 9.35E 00 9.13E 00 8.99E 00 8.91E 00 8.87E 00 8.86E 00 8.88E 00 8.88E 00
16 0.05078 1.04E 01 9.85E 00 9.43E 00 9.12E 00 8.91E 00 8.77E 00 8.67E 00 8.61E 00 8.59E 00 8.58E 00 8.58E 00
15 0.04812 9.87E 00 9.45E 00 9.11E 00 8.84E 00 8.64E 00 8.50E 00 8.40E 00 8.34E 00 8.30E 00 8.28E 00 8.28E 00
14 0.04562 9.28E 00 9.00E 00 8.74E 00 8.52E 00 8.35E 00 8.22E 00 8.12E 00 8.06E 00 8.01E 00 7.99E 00 7.99E 00
13 0.04328 8.67E 00 8.52E 00 8.35E 00 8.19E 00 8.05E 00 7.94E 00 7.85E 00 7.79E 00 7.74E 00 7.71E 00 7.71E 00
12 0.04094 8.00E 00 7.98E 00 7.92E 00 7.82E 00 7.72E 00 7.64E 00 7.57E 00 7.51E 00 7.47E 00 7.44E 00 7.44E 00
11 0.03719 6.84E 00 7.04E 00 7.14E 00 7.17E 00 7.16E 00 7.13E 00 7.09E 00 7.05E 00 7.02E 00 6.99E 00 6.99E 00
10 0.03437 5.93E 00 6.30E 00 6.53E 00 6.65E 00 6.71E 00 6.73E 00 6.73E 00 6.71E 00 6.69E 00 6.66E 00 6.66E 00
9 0.03219 5.21E 00 5.70E 00 6.04E 00 6.24E 00 6.36E 00 6.42E 00 6.45E 00 6.45E 00 6.44E 00 6.42E 00 6.42E 00
8 0.03031 4.59E 00 5.19E 00 5.61E 00 5.89E 00 6.06E 00 6.16E 00 6.22E 00 6.23E 00 6.23E 00 6.21E 00 6.21E 00
7 0.02687 3.46E 00 4.25E 00 4.84E 00 5.25E 00 5.52E 00 5.69E 00 5.80E 00 5.85E 00 5.86E 00 5.85E 00 5.85E 00
6 0.02187 1.89E 00 2.93E 00 3.75E 00 4.34E 00 4.76E 00 5.04E 00 5.23E 00 5.33E 00 5.37E 00 5.38E 00 5.37E 00
```


[illegible]

0	J	Y												
11	1.00000	0.00	3.12E-02	3.91E-02	4.69E-02	5.47E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	0.00	2.96E-02	3.67E-02	4.53E-02	5.32E-02	5.98E-02	6.08E-02	6.09E-02	6.08E-02	6.07E-02	6.05E-02	6.04E-02	
9	0.80000	0.00	2.79E-02	3.43E-02	4.36E-02	5.16E-02	5.77E-02	5.91E-02	5.93E-02	5.91E-02	5.89E-02	5.86E-02	5.83E-02	
8	0.70000	0.00	2.61E-02	3.19E-02	4.16E-02	4.98E-02	5.57E-02	5.75E-02	5.78E-02	5.75E-02	5.71E-02	5.67E-02	5.62E-02	
7	0.60000	0.00	2.41E-02	2.96E-02	3.93E-02	4.80E-02	5.40E-02	5.60E-02	5.62E-02	5.59E-02	5.53E-02	5.47E-02	5.40E-02	
6	0.50000	0.00	2.21E-02	2.73E-02	3.70E-02	4.61E-02	5.22E-02	5.44E-02	5.46E-02	5.42E-02	5.35E-02	5.25E-02	5.16E-02	
5	0.40000	0.00	1.96E-02	2.48E-02	3.45E-02	4.42E-02	5.05E-02	5.28E-02	5.30E-02	5.24E-02	5.14E-02	5.02E-02	4.89E-02	
4	0.30000	0.00	1.70E-02	2.23E-02	3.18E-02	4.20E-02	4.87E-02	5.12E-02	5.13E-02	5.05E-02	4.91E-02	4.75E-02	4.58E-02	
3	0.20000	0.00	1.37E-02	1.90E-02	2.88E-02	3.96E-02	4.67E-02	4.94E-02	4.94E-02	4.83E-02	4.64E-02	4.43E-02	4.21E-02	
2	0.10000	0.00	9.69E-03	1.52E-02	2.53E-02	3.69E-02	4.45E-02	4.74E-02	4.72E-02	4.56E-02	4.29E-02	4.00E-02	3.72E-02	
1	0.00000	0.00	0.00	6.74E-03	2.03E-02	3.36E-02	4.19E-02	4.50E-02	4.45E-02	4.17E-02	3.77E-02	3.32E-02	2.77E-02	

[illegible][illegible]

21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.91E 01	1.79E 01	1.62E 01	1.50E 01	1.41E 01	1.40E 01	1.52E 01	1.67E 01			
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.29E 02	3.40E 02	2.90E 02	2.45E 02	2.17E 02	2.39E 02	3.56E 02	4.62E 02			
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.92E 02	3.27E 02	2.92E 02	2.72E 02	2.83E 02	4.23E 02	7.08E 02	9.28E 02			
17	0.42750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	6.00E 01	1.92E 02	2.13E 02	2.36E 02	2.62E 02	3.50E 02	6.06E 02	9.40E 02	1.18E 03			
16	0.40625	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.77E 02	2.71E 02	2.42E 02	2.47E 02	3.05E 02	5.03E 02	8.33E 02	1.17E 03	1.40E 03			
15	0.38500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.54E 02	2.25E 02	2.20E 02	2.68E 02	4.25E 02	7.22E 02	1.06E 03	1.37E 03	1.59E 03			
14	0.36500	1.00E 00	1.00E 00	6.92E 01	1.44E 02	1.72E 02	2.24E 02	3.52E 02	6.14E 02	9.43E 02	1.26E 03	1.54E 03	1.75E 03				
13	0.34625	1.00E 00	1.00E 00	3.59E 02	1.81E 02	1.88E 02	2.90E 02	5.02E 02	8.17E 02	1.14E 03	1.43E 03	1.69E 03	1.88E 03				
12	0.32750	1.00E 00	1.00E 00	3.03E 02	1.29E 02	1.94E 02	3.75E 02	6.81E 02	1.01E 03	1.31E 03	1.58E 03	1.82E 03	2.00E 03				
11	0.29750	1.00E 00	1.19E 02	9.17E 01	8.73E 01	2.28E 02	5.79E 02	9.90E 02	1.29E 03	1.55E 03	1.80E 03	2.01E 03	2.17E 03				
10	0.27500	1.00E 00	4.05E 02	8.32E 01	8.64E 01	3.16E 02	7.90E 02	1.18E 03	1.45E 03	1.69E 03	1.93E 03	2.14E 03	2.28E 03				
9	0.25750	1.00E 00	3.74E 02	3.42E 01	8.78E 01	4.23E 02	9.44E 02	1.30E 03	1.55E 03	1.79E 03	2.02E 03	2.22E 03	2.35E 03				
8	0.24250	1.00E 00	7.02E 00	9.62E 00	1.03E 02	5.30E 02	1.07E 03	1.39E 03	1.63E 03	1.87E 03	2.09E 03	2.28E 03	2.41E 03				
7	0.21500	1.00E 00	7.02E 00	1.29E 01	1.54E 02	7.44E 02	1.27E 03	1.54E 03	1.77E 03	1.99E 03	2.21E 03	2.39E 03	2.51E 03				
6	0.17500	1.00E 00	7.09E 00	2.36E 01	2.86E 02	1.15E 03	1.53E 03	1.74E 03	1.94E 03	2.15E 03	2.36E 03	2.52E 03	2.62E 03				
5	0.13000	1.00E 00	7.38E 00	6.22E 01	6.27E 02	1.41E 03	1.76E 03	1.93E 03	2.11E 03	2.31E 03	2.49E 03	2.64E 03	2.72E 03				
4	0.08500	1.00E 00	8.64E 00	2.15E 02	8.31E 02	1.67E 03	1.94E 03	2.09E 03	2.25E 03	2.43E 03	2.60E 03	2.73E 03	2.80E 03				
3	0.04500	1.00E 00	1.52E 01	1.27E 03	1.20E 03	1.86E 03	2.07E 03	2.21E 03	2.36E 03	2.53E 03	2.69E 03	2.81E 03	2.87E 03				
2	0.01250	1.00E 00	4.80E 01	1.53E 03	1.52E 03	2.01E 03	2.17E 03	2.30E 03	2.46E 03	2.63E 03	2.78E 03	2.90E 03	2.95E 03				
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 1.26289 1.46130 1.68153 1.92598 2.19733 2.49852 2.83285 3.16718 3.50150 3.83583 4.17015

0 J	Y																
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.73E 01	1.72E 01	1.67E 01	1.60E 01	1.53E 01	1.47E 01	1.42E 01	1.38E 01	1.35E 01	1.34E 01	1.00E 00					
19	0.47500	4.88E 02	4.57E 02	3.96E 02	3.27E 02	2.60E 02	2.02E 02	1.57E 02	1.26E 02	1.04E 02	1.12E 02	1.00E 00					
18	0.44750	9.91E 02	9.43E 02	8.37E 02	7.10E 02	5.85E 02	4.71E 02	3.79E 02	3.10E 02	2.58E 02	2.84E 02	1.00E 00					
17	0.42750	1.26E 03	1.21E 03	1.09E 03	9.45E 02	7.95E 02	6.56E 02	5.42E 02	4.54E 02	3.86E 02	4.27E 02	1.00E 00					
16	0.40625	1.49E 03	1.44E 03	1.32E 03	1.16E 03	9.89E 02	8.32E 02	7.02E 02	6.00E 02	5.21E 02	5.73E 02	1.00E 00					
15	0.38500	1.68E 03	1.63E 03	1.50E 03	1.33E 03	1.16E 03	9.87E 02	8.44E 02	7.32E 02	6.45E 02	7.06E 02	1.00E 00					
14	0.36500	1.83E 03	1.78E 03	1.65E 03	1.48E 03	1.29E 03	1.11E 03	9.62E 02	8.43E 02	7.50E 02	8.16E 02	1.00E 00					
13	0.34625	1.95E 03	1.90E 03	1.77E 03	1.59E 03	1.40E 03	1.22E 03	1.06E 03	9.36E 02	8.38E 02	9.07E 02	1.00E 00					
12	0.32750	2.06E 03	2.01E 03	1.87E 03	1.69E 03	1.49E 03	1.31E 03	1.15E 03	1.02E 03	9.17E 02	9.87E 02	1.00E 00					
11	0.29750	2.22E 03	2.16E 03	2.01E 03	1.82E 03	1.62E 03	1.43E 03	1.26E 03	1.13E 03	1.02E 03	1.09E 03	1.00E 00					
10	0.27500	2.32E 03	2.25E 03	2.10E 03	1.91E 03	1.70E 03	1.51E 03	1.34E 03	1.20E 03	1.09E 03	1.16E 03	1.00E 00					
9	0.25750	2.38E 03	2.31E 03	2.16E 03	1.97E 03	1.76E 03	1.56E 03	1.39E 03	1.25E 03	1.14E 03	1.21E 03	1.00E 00					
8	0.24250	2.44E 03	2.36E 03	2.21E 03	2.01E 03	1.80E 03	1.60E 03	1.43E 03	1.29E 03	1.17E 03	1.24E 03	1.00E 00					
7	0.21500	2.53E 03	2.44E 03	2.28E 03	2.08E 03	1.87E 03	1.66E 03	1.49E 03	1.34E 03	1.23E 03	1.29E 03	1.00E 00					
6	0.17500	2.63E 03	2.54E 03	2.37E 03	2.16E 03	1.94E 03	1.74E 03	1.56E 03	1.41E 03	1.29E 03	1.34E 03	1.00E 00					
5	0.13000	2.72E 03	2.63E 03	2.45E 03	2.23E 03	2.01E 03	1.80E 03	1.62E 03	1.47E 03	1.35E 03	1.38E 03	1.00E 00					
4	0.08500	2.79E 03	2.69E 03	2.52E 03	2.29E 03	2.06E 03	1.85E 03	1.66E 03	1.51E 03	1.38E 03	1.41E 03	1.00E 00					
3	0.04500	2.85E 03	2.75E 03	2.57E 03	2.33E 03	2.09E 03	1.88E 03	1.68E 03	1.53E 03	1.40E 03	1.43E 03	1.00E 00					
2	0.01250	2.92E 03	2.80E 03	2.61E 03	2.36E 03	2.12E 03	1.90E 03	1.70E 03	1.54E 03	1.41E 03	1.45E 03	1.00E 00					
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

I	X/D	S.S.COEFF.
2	3.148E-02	9.794E-03
3	9.443E-02	6.821E-03

103	0.1242E	00	0.7476E-01	0.3960E-01	0.3459E-01	0.1209E-01	0.6847E	08	0.5677E	01-0.7863E-02	0.1407E	02	0.1517E	04	0.1752E	04
104	0.1223E	00	0.7237E-01	0.3820E-01	0.3327E-01	0.1182E-01	0.6917E	08	0.5663E	01-0.7510E-02	0.1410E	02	0.1518E	04	0.1760E	04
105	0.1203E	00	0.7001E-01	0.3682E-01	0.3196E-01	0.1159E-01	0.7045E	08	0.5650E	01-0.7142E-02	0.1412E	02	0.1519E	04	0.1769E	04
106	0.1184E	00	0.6764E-01	0.3552E-01	0.3068E-01	0.1139E-01	0.7107E	08	0.5636E	01-0.6761E-02	0.1415E	02	0.1519E	04	0.1778E	04
107	0.1164E	00	0.6520E-01	0.3426E-01	0.2947E-01	0.1118E-01	0.7251E	08	0.5623E	01-0.6369E-02	0.1417E	02	0.1520E	04	0.1786E	04
108	0.1146E	00	0.6272E-01	0.3304E-01	0.2823E-01	0.1095E-01	0.7442E	08	0.5611E	01-0.5967E-02	0.1419E	02	0.1521E	04	0.1794E	04
109	0.1128E	00	0.6023E-01	0.3187E-01	0.2704E-01	0.1070E-01	0.7641E	08	0.5599E	01-0.5559E-02	0.1422E	02	0.1522E	04	0.1802E	04
110	0.1111E	00	0.5772E-01	0.3072E-01	0.2590E-01	0.1045E-01	0.7795E	08	0.5588E	01-0.5144E-02	0.1424E	02	0.1523E	04	0.1809E	04
111	0.1094E	00	0.5525E-01	0.2961E-01	0.2480E-01	0.1020E-01	0.7940E	08	0.5577E	01-0.4727E-02	0.1426E	02	0.1524E	04	0.1817E	04
112	0.1076E	00	0.5277E-01	0.2857E-01	0.2370E-01	0.9964E-02	0.8095E	08	0.5567E	01-0.4307E-02	0.1428E	02	0.1525E	04	0.1824E	04
113	0.1058E	00	0.5033E-01	0.2758E-01	0.2268E-01	0.9746E-02	0.8239E	08	0.5557E	01-0.3887E-02	0.1430E	02	0.1526E	04	0.1831E	04
114	0.1042E	00	0.4804E-01	0.2670E-01	0.2167E-01	0.9399E-02	0.7779E	08	0.5548E	01-0.3490E-02	0.1432E	02	0.1527E	04	0.1838E	04
115	0.1026E	00	0.4600E-01	0.2588E-01	0.2059E-01	0.9072E-02	0.7789E	08	0.5539E	01-0.3103E-02	0.1434E	02	0.1528E	04	0.1844E	04
116	0.1011E	00	0.4407E-01	0.2509E-01	0.1965E-01	0.8770E-02	0.7912E	08	0.5531E	01-0.2719E-02	0.1436E	02	0.1528E	04	0.1850E	04
117	0.9963E-01		0.4215E-01	0.2432E-01	0.1877E-01	0.8490E-02	0.8096E	08	0.5523E	01-0.2336E-02	0.1438E	02	0.1529E	04	0.1856E	04
118	0.9823E-01		0.4030E-01	0.2359E-01	0.1816E-01	0.8238E-02	0.8702E	08	0.5514E	01-0.2153E-02	0.1440E	02	0.1530E	04	0.1862E	04
119	0.9544E-01		0.4457E-01	0.2290E-01	0.1737E-01	0.8013E-02	0.9202E	08	0.5507E	01-0.1777E-02	0.1442E	02	0.1531E	04	0.1867E	04
120	0.9392E-01		0.4166E-01	0.2229E-01	0.1648E-01	0.7807E-02	0.9654E	08	0.5499E	01-0.1365E-02	0.1444E	02	0.1532E	04	0.1871E	04
121	0.9201E-01		0.3980E-01	0.2170E-01	0.1579E-01	0.7618E-02	0.9869E	08	0.5493E	01-0.9176E-03	0.1445E	02	0.1533E	04	0.1876E	04
122	0.9045E-01		0.3721E-01	0.2116E-01	0.1512E-01	0.7448E-02	0.9910E	08	0.5487E	01-0.4753E-03	0.1447E	02	0.1534E	04	0.1880E	04
123	0.8888E-01		0.3488E-01	0.2070E-01	0.1446E-01	0.7301E-02	0.9851E	08	0.5482E	01-0.3682E-04	0.1449E	02	0.1535E	04	0.1885E	04
124	0.8742E-01		0.3270E-01	0.2026E-01	0.1386E-01	0.7152E-02	0.9878E	08	0.5478E	01-0.3876E-03	0.1450E	02	0.1536E	04	0.1888E	04
125	0.8608E-01		0.3072E-01	0.1985E-01	0.1326E-01	0.6998E-02	0.9881E	08	0.5475E	01-0.7995E-03	0.1452E	02	0.1537E	04	0.1892E	04
126	0.8486E-01		0.2889E-01	0.1945E-01	0.1268E-01	0.6846E-02	0.9955E	08	0.5472E	01-0.1195E-02	0.1453E	02	0.1538E	04	0.1896E	04
127	0.8363E-01		0.2711E-01	0.1910E-01	0.1216E-01	0.6693E-02	0.9982E	08	0.5470E	01-0.1574E-02	0.1455E	02	0.1539E	04	0.1899E	04
128	0.8238E-01		0.2540E-01	0.1877E-01	0.1166E-01	0.6541E-02	0.1002E	09	0.5468E	01-0.1933E-02	0.1456E	02	0.1539E	04	0.1902E	04
129	0.8123E-01		0.2375E-01	0.1850E-01	0.1119E-01	0.6393E-02	0.1006E	09	0.5467E	01-0.2274E-02	0.1457E	02	0.1540E	04	0.1905E	04
130	0.8015E-01		0.2220E-01	0.1826E-01	0.1072E-01	0.6257E-02	0.1008E	09	0.5467E	01-0.2594E-02	0.1459E	02	0.1541E	04	0.1908E	04
131	0.7911E-01		0.2077E-01	0.1806E-01	0.1031E-01	0.6138E-02	0.1010E	09	0.5467E	01-0.2895E-02	0.1460E	02	0.1542E	04	0.1911E	04
132	0.7811E-01		0.1946E-01	0.1785E-01	0.1002E-01	0.6057E-02	0.1058E	09	0.5468E	01-0.3645E-02	0.1461E	02	0.1543E	04	0.1913E	04
133	0.7625E-01		0.2201E-01	0.1770E-01	0.9648E-02	0.5965E-02	0.1104E	09	0.5470E	01-0.4055E-02	0.1462E	02	0.1544E	04	0.1915E	04
134	0.7531E-01		0.1928E-01	0.1758E-01	0.9261E-02	0.5876E-02	0.1141E	09	0.5472E	01-0.4375E-02	0.1463E	02	0.1545E	04	0.1917E	04
135	0.7392E-01		0.1852E-01	0.1745E-01	0.8888E-02	0.5776E-02	0.1146E	09	0.5475E	01-0.4614E-02	0.1464E	02	0.1546E	04	0.1919E	04
136	0.7280E-01		0.1713E-01	0.1736E-01	0.8593E-02	0.5675E-02	0.1142E	09	0.5479E	01-0.4824E-02	0.1465E	02	0.1547E	04	0.1921E	04
137	0.7166E-01		0.1630E-01	0.1729E-01	0.8364E-02	0.5585E-02	0.1128E	09	0.5483E	01-0.5002E-02	0.1466E	02	0.1547E	04	0.1922E	04
138	0.7048E-01		0.1559E-01	0.1723E-01	0.8077E-02	0.5506E-02	0.1121E	09	0.5488E	01-0.5161E-02	0.1467E	02	0.1548E	04	0.1924E	04
139	0.6924E-01		0.1509E-01	0.1718E-01	0.7814E-02	0.5436E-02	0.1119E	09	0.5493E	01-0.5296E-02	0.1467E	02	0.1549E	04	0.1925E	04
140	0.6797E-01		0.1477E-01	0.1714E-01	0.7618E-02	0.5368E-02	0.1119E	09	0.5498E	01-0.5411E-02	0.1468E	02	0.1550E	04	0.1926E	04
141	0.6671E-01		0.1470E-01	0.1710E-01	0.7418E-02	0.5301E-02	0.1120E	09	0.5504E	01-0.5505E-02	0.1469E	02	0.1551E	04	0.1927E	04
142	0.6544E-01		0.1491E-01	0.1707E-01	0.7263E-02	0.5235E-02	0.1117E	09	0.5510E	01-0.5580E-02	0.1470E	02	0.1552E	04	0.1928E	04
143	0.6414E-01		0.1522E-01	0.1707E-01	0.7077E-02	0.5172E-02	0.1117E	09	0.5517E	01-0.5636E-02	0.1471E	02	0.1553E	04	0.1929E	04
144	0.6284E-01		0.1551E-01	0.1711E-01	0.6957E-02	0.5127E-02	0.1113E	09	0.5524E	01-0.5673E-02	0.1471E	02	0.1553E	04	0.1930E	04
145	0.6153E-01		0.1578E-01	0.1717E-01	0.6808E-02	0.5087E-02	0.1114E	09	0.5531E	01-0.5692E-02	0.1472E	02	0.1554E	04	0.1930E	04
146	0.6022E-01		0.1604E-01	0.1724E-01	0.6734E-02	0.5045E-02	0.1111E	09	0.5538E	01-0.5694E-02	0.1473E	02	0.1555E	04	0.1931E	04
147	0.5889E-01		0.1627E-01	0.1732E-01	0.6607E-02	0.5006E-02	0.1110E	09	0.5545E	01-0.5680E-02	0.1473E	02	0.1556E	04	0.1931E	04
148	0.5755E-01		0.1652E-01	0.1742E-01	0.6584E-02	0.4982E-02	0.1111E	09	0.5553E	01-0.5650E-02	0.1474E	02	0.1557E	04	0.1932E	04
149	0.5622E-01		0.1671E-01	0.1755E-01	0.6523E-02	0.4955E-02	0.1106E	09	0.5560E	01-0.5605E-02	0.1474E	02	0.1557E	04	0.1932E	04
150	0.5489E-01		0.1690E-01	0.1771E-01	0.6498E-02	0.4926E-02	0.1108E	09	0.5568E	01-0.5547E-02	0.1475E	02	0.1558E	04	0.1932E	04
151	0.5357E-01		0.1703E-01	0.1789E-01	0.6449E-02	0.4891E-02	0.1106E	09	0.5575E	01-0.5476E-02	0.1476E	02	0.1559E	04	0.1933E	04
152	0.5225E-01		0.1712E-01	0.1806E-01	0.6425E-02	0.4852E-02	0.1103E	09	0.5583E	01-0.5392E-02	0.1476E	02	0.1560E	04	0.1933E	04
153	0.5093E-01		0.1719E-01	0.1822E-01	0.6449E-02	0.4810E-02	0.1103E	09	0.5591E	01-0.5299E-02	0.1477E	02	0.1560E	04	0.1933E	04
154	0.4963E-01		0.1721E-01	0.1838E-01	0.6440E-02	0.4761E-02	0.1102E	09	0.5599E	01-0.5196E-02	0.1477E	02	0.1561E	04	0.1933E	04
155	0.4834E-01		0.1722E-01	0.1854E-01	0.6427E-02	0.4713E-02	0.1101E	09	0.5606E	01-0.5082E-02	0.1478E	02	0.1562E	04	0.1933E	04
156	0.4706E-01		0.1722E-01	0.1869E-01	0.6447E-02	0.4663E-02	0.1098E	09	0.5614E	01-0.4961E-02	0.1478E	02	0.1563E	04	0.1933E	04

9	0.03219	0.00	3.62E 01	1.30E 01	3.28E 01	5.89E 01	5.93E 01	6.56E 01	7.09E 01	7.32E 01	7.26E 01	6.91E 01	6.25E 01
8	0.03031	2.70E 01	9.06E 00	1.02E 01	3.93E 01	6.05E 01	5.85E 01	6.46E 01	7.00E 01	7.27E 01	7.25E 01	6.91E 01	6.26E 01
7	0.02687	2.70E 01	9.11E 00	1.36E 01	5.05E 01	6.02E 01	5.68E 01	6.21E 01	6.77E 01	7.11E 01	7.15E 01	6.85E 01	6.23E 01
6	0.02187	2.70E 01	9.32E 00	2.17E 01	7.09E 01	5.32E 01	5.42E 01	5.85E 01	6.40E 01	6.79E 01	6.89E 01	6.65E 01	6.08E 01
5	0.01625	2.70E 01	1.00E 01	4.04E 01	7.24E 01	5.02E 01	5.18E 01	5.53E 01	6.01E 01	6.40E 01	6.53E 01	6.33E 01	5.82E 01
4	0.01062	2.70E 01	1.27E 01	7.47E 01	5.75E 01	4.91E 01	5.00E 01	5.30E 01	5.70E 01	6.05E 01	6.19E 01	6.02E 01	5.55E 01
3	0.00562	2.70E 01	2.23E 01	7.38E 01	5.13E 01	4.83E 01	4.91E 01	5.17E 01	5.54E 01	5.85E 01	5.98E 01	5.82E 01	5.38E 01
2	0.00156	2.70E 01	3.49E 01	7.04E 01	5.00E 01	4.81E 01	4.89E 01	5.15E 01	5.50E 01	5.80E 01	5.92E 01	5.77E 01	5.34E 01
1-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	3.86E 00	3.65E 00	3.34E 00	3.04E 00	2.78E 00	2.56E 00	2.39E 00	2.25E 00	2.13E 00	2.12E 00	2.70E 01	
19	0.05937	2.02E 01	1.78E 01	1.49E 01	1.20E 01	9.59E 00	7.63E 00	6.17E 00	5.16E 00	4.46E 00	5.04E 00	2.70E 01	
18	0.05594	2.93E 01	2.54E 01	2.10E 01	1.68E 01	1.33E 01	1.05E 01	8.39E 00	6.89E 00	5.82E 00	6.98E 00	2.70E 01	
17	0.05344	3.41E 01	2.93E 01	2.40E 01	1.92E 01	1.51E 01	1.19E 01	9.54E 00	7.84E 00	6.62E 00	8.15E 00	2.70E 01	
16	0.05078	3.85E 01	3.27E 01	2.66E 01	2.12E 01	1.67E 01	1.32E 01	1.06E 01	8.70E 00	7.37E 00	9.21E 00	2.70E 01	
15	0.04812	4.23E 01	3.56E 01	2.88E 01	2.29E 01	1.80E 01	1.42E 01	1.14E 01	9.42E 00	8.00E 00	1.01E 01	2.70E 01	
14	0.04562	4.54E 01	3.79E 01	3.06E 01	2.42E 01	1.91E 01	1.50E 01	1.21E 01	9.99E 00	8.51E 00	1.07E 01	2.70E 01	
13	0.04328	4.78E 01	3.97E 01	3.20E 01	2.53E 01	1.99E 01	1.57E 01	1.26E 01	1.04E 01	8.90E 00	1.12E 01	2.70E 01	
12	0.04094	4.98E 01	4.12E 01	3.31E 01	2.62E 01	2.06E 01	1.62E 01	1.30E 01	1.08E 01	9.23E 00	1.16E 01	2.70E 01	
11	0.03719	5.22E 01	4.30E 01	3.45E 01	2.72E 01	2.14E 01	1.69E 01	1.36E 01	1.13E 01	9.62E 00	1.19E 01	2.70E 01	
10	0.03437	5.33E 01	4.39E 01	3.51E 01	2.77E 01	2.18E 01	1.72E 01	1.38E 01	1.15E 01	9.82E 00	1.20E 01	2.70E 01	
9	0.03219	5.37E 01	4.43E 01	3.55E 01	2.80E 01	2.20E 01	1.73E 01	1.40E 01	1.16E 01	9.91E 00	1.21E 01	2.70E 01	
8	0.03031	5.39E 01	4.44E 01	3.56E 01	2.81E 01	2.21E 01	1.74E 01	1.40E 01	1.17E 01	9.96E 00	1.20E 01	2.70E 01	
7	0.02687	5.38E 01	4.44E 01	3.56E 01	2.81E 01	2.21E 01	1.74E 01	1.41E 01	1.17E 01	9.97E 00	1.18E 01	2.70E 01	
6	0.02187	5.27E 01	4.37E 01	3.51E 01	2.77E 01	2.18E 01	1.73E 01	1.39E 01	1.16E 01	9.87E 00	1.14E 01	2.70E 01	
5	0.01625	5.07E 01	4.23E 01	3.41E 01	2.70E 01	2.13E 01	1.69E 01	1.37E 01	1.13E 01	9.68E 00	1.09E 01	2.70E 01	
4	0.01062	4.87E 01	4.08E 01	3.31E 01	2.63E 01	2.08E 01	1.65E 01	1.34E 01	1.11E 01	9.48E 00	1.04E 01	2.70E 01	
3	0.00562	4.74E 01	3.99E 01	3.25E 01	2.59E 01	2.05E 01	1.63E 01	1.32E 01	1.10E 01	9.38E 00	1.01E 01	2.70E 01	
2	0.00156	4.70E 01	3.97E 01	3.24E 01	2.58E 01	2.04E 01	1.63E 01	1.32E 01	1.10E 01	9.41E 00	1.01E 01	2.70E 01	
1-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	*****												
	TURBULENCE	DISSIPATION	*****										
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	5.77E 03	5.16E 03	3.74E 03	2.88E 03	2.54E 03	2.94E 03	3.97E 03	4.71E 03
19	0.05937	0.00	0.00	0.00	0.00	9.89E 03	1.05E 04	7.42E 03	5.13E 03	3.82E 03	3.61E 03	4.15E 03	4.54E 03
18	0.05594	0.00	0.00	0.00	0.00	1.97E 04	1.45E 04	9.76E 03	6.78E 03	5.33E 03	5.13E 03	5.30E 03	5.14E 03
17	0.05344	0.00	0.00	0.00	1.46E 04	1.61E 04	1.17E 04	8.91E 03	7.26E 03	6.68E 03	6.63E 03	6.41E 03	5.79E 03
16	0.05078	0.00	0.00	0.00	2.71E 04	1.72E 04	1.19E 04	9.40E 03	8.69E 03	8.71E 03	8.47E 03	7.69E 03	6.53E 03
15	0.04812	0.00	0.00	0.00	2.51E 04	1.64E 04	1.20E 04	1.07E 04	1.11E 04	1.11E 04	1.03E 04	8.88E 03	7.24E 03
14	0.04562	0.00	0.00	2.56E 04	2.10E 04	1.56E 04	1.30E 04	1.30E 04	1.37E 04	1.32E 04	1.17E 04	9.81E 03	7.81E 03
13	0.04328	0.00	0.00	3.69E 04	2.06E 04	1.63E 04	1.46E 04	1.53E 04	1.57E 04	1.46E 04	1.27E 04	1.05E 04	8.22E 03
12	0.04094	0.00	0.00	2.06E 04	1.74E 04	1.73E 04	1.60E 04	1.68E 04	1.69E 04	1.54E 04	1.33E 04	1.09E 04	8.50E 03
11	0.03719	0.00	2.56E 04	2.11E 04	1.96E 04	2.11E 04	1.76E 04	1.77E 04	1.75E 04	1.59E 04	1.36E 04	1.12E 04	8.72E 03
10	0.03437	0.00	3.95E 04	2.38E 04	2.38E 04	2.43E 04	1.67E 04	1.68E 04	1.68E 04	1.54E 04	1.34E 04	1.11E 04	8.68E 03
9	0.03219	0.00	2.17E 04	2.45E 04	2.83E 04	2.38E 04	1.52E 04	1.56E 04	1.58E 04	1.48E 04	1.30E 04	1.09E 04	8.56E 03
8	0.03031	4.49E 05	8.18E 04	3.16E 04	3.31E 04	2.20E 04	1.38E 04	1.44E 04	1.48E 04	1.41E 04	1.26E 04	1.06E 04	8.40E 03
7	0.02687	4.49E 05	8.21E 04	3.67E 04	3.88E 04	1.74E 04	1.17E 04	1.23E 04	1.29E 04	1.27E 04	1.16E 04	9.99E 03	8.01E 03
6	0.02187	4.49E 05	8.32E 04	4.65E 04	4.53E 04	1.13E 04	9.41E 03	9.95E 03	1.07E 04	1.08E 04	1.02E 04	8.96E 03	7.30E 03
5	0.01625	4.49E 05	8.71E 04	6.39E 04	2.34E 04	8.32E 03	7.69E 03	8.11E 03	8.71E 03	9.01E 03	8.71E 03	7.79E 03	6.46E 03

7	0.21500	4.00E 05	4.05E 05	4.10E 05	4.14E 05	4.17E 05	4.20E 05	4.23E 05	4.26E 05	4.28E 05	4.31E 05		0.00
6	0.17500	3.72E 05	3.80E 05	3.87E 05	3.93E 05	3.98E 05	4.03E 05	4.07E 05	4.11E 05	4.14E 05	4.17E 05		0.00
5	0.13000	3.45E 05	3.57E 05	3.67E 05	3.75E 05	3.82E 05	3.88E 05	3.93E 05	3.97E 05	4.01E 05	4.05E 05		0.00
4	0.08500	3.25E 05	3.40E 05	3.52E 05	3.61E 05	3.69E 05	3.76E 05	3.82E 05	3.88E 05	3.92E 05	3.97E 05		0.00
3	0.04500	3.13E 05	3.30E 05	3.43E 05	3.54E 05	3.63E 05	3.70E 05	3.77E 05	3.82E 05	3.87E 05	3.92E 05		0.00
2	0.01250	3.09E 05	3.26E 05	3.40E 05	3.51E 05	3.60E 05	3.68E 05	3.75E 05	3.80E 05	3.85E 05	3.90E 05		0.00
1-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
0*-**--*													
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	4.87E-03	4.52E-03	3.65E-03	3.07E-03	2.82E-03	3.11E-03	3.80E-03	4.26E-03
19	0.47500	0.00	0.00	0.00	0.00	2.74E-02	2.97E-02	2.33E-02	1.81E-02	1.55E-02	1.71E-02	2.12E-02	2.33E-02
18	0.44750	0.00	0.00	0.00	0.00	4.33E-02	3.50E-02	2.76E-02	2.28E-02	2.24E-02	2.75E-02	3.31E-02	3.48E-02
17	0.42750	0.00	0.00	0.00	1.44E-02	2.93E-02	2.75E-02	2.54E-02	2.50E-02	2.91E-02	3.60E-02	4.09E-02	4.13E-02
16	0.40625	0.00	0.00	0.00	5.00E-02	3.64E-02	3.01E-02	2.82E-02	3.15E-02	3.89E-02	4.57E-02	4.89E-02	4.76E-02
15	0.38500	0.00	0.00	0.00	4.75E-02	3.39E-02	3.08E-02	3.38E-02	4.18E-02	5.00E-02	5.51E-02	5.61E-02	5.31E-02
14	0.36500	0.00	0.00	2.09E-02	2.97E-02	3.08E-02	3.46E-02	4.30E-02	5.30E-02	5.99E-02	6.28E-02	6.20E-02	5.76E-02
13	0.34625	0.00	0.00	5.73E-02	3.39E-02	3.46E-02	4.20E-02	5.30E-02	6.25E-02	6.75E-02	6.87E-02	6.66E-02	6.11E-02
12	0.32750	0.00	0.00	3.88E-02	2.77E-02	3.77E-02	4.94E-02	6.14E-02	6.97E-02	7.33E-02	7.33E-02	7.02E-02	6.40E-02
11	0.29750	0.00	2.74E-02	2.19E-02	2.63E-02	4.71E-02	6.16E-02	7.11E-02	7.72E-02	7.94E-02	7.84E-02	7.44E-02	6.74E-02
10	0.27500	0.00	5.99E-02	2.17E-02	3.11E-02	6.08E-02	6.56E-02	7.32E-02	7.90E-02	8.12E-02	8.02E-02	7.61E-02	6.88E-02
9	0.25750	0.00	4.02E-02	1.44E-02	3.65E-02	6.54E-02	6.59E-02	7.29E-02	7.87E-02	8.13E-02	8.07E-02	7.67E-02	6.94E-02
8	0.24250	3.00E-02	1.01E-02	1.14E-02	4.36E-02	6.72E-02	6.50E-02	7.17E-02	7.77E-02	8.08E-02	8.05E-02	7.68E-02	6.96E-02
7	0.21500	3.00E-02	1.01E-02	1.51E-02	5.61E-02	6.69E-02	6.31E-02	6.90E-02	7.52E-02	7.90E-02	7.94E-02	7.62E-02	6.92E-02
6	0.17500	3.00E-02	1.04E-02	2.41E-02	7.88E-02								

DIMENSIONLESS STREAMLINE PLOT															
OITER NO	I---			ABSOLUTE RESIDUAL		SOURCE SUMS		---I		I--- FIELD VALUES AT MONITORING LOCATION(22, 8) ---I					
	UMON	VMON	WMON	MASS	TKIN	DISP	U	V	W	P	D				
1	0.1578E-01	0.1545E-01	0.1466E 00	0.5586E-02	0.8554E-02	0.5085E 10	0.5782E 01	0.4879E-04	0.1505E 02	0.1590E 04	0.1935E 04				
2	0.1535E-01	0.1793E 00	0.1250E 00	0.1949E-01	0.1379E-01	0.8745E 10	0.5782E 01	0.3198E-04	0.1505E 02	0.1773E 04	0.1935E 04				
3	0.9220E-01	0.2586E 00	0.1127E 00	0.2831E-01	0.1742E-01	0.1089E 11	0.5783E 01	0.8485E-05	0.1506E 02	0.1941E 04	0.1935E 04				
4	0.2346E 00	0.2346E 00	0.1050E 00	0.1843E-01	0.1909E-01	0.1025E 11	0.5783E 01	0.3282E-04	0.1506E 02	0.1905E 04	0.1935E 04				
5	0.2449E 00	0.2529E 00	0.1006E 00	0.1920E-01	0.1988E-01	0.8319E 10	0.5783E 01	0.4619E-04	0.1507E 02	0.1866E 04	0.1935E 04				
6	0.2676E 00	0.2534E 00	0.9846E-01	0.2035E-01	0.2130E-01	0.7485E 10	0.5783E 01	0.5834E-04	0.1507E 02	0.1823E 04	0.1935E 04				
7	0.2772E 00	0.2558E 00	0.9733E-01	0.2071E-01	0.2179E-01	0.7102E 10	0.5783E 01	0.7043E-04	0.1508E 02	0.1787E 04	0.1935E 04				
8	0.2806E 00	0.2558E 00	0.9621E-01	0.2085E-01	0.2190E-01	0.6836E 10	0.5783E 01	0.8161E-04	0.1508E 02	0.1759E 04	0.1936E 04				
9	0.2839E 00	0.2561E 00	0.9496E-01	0.2113E-01	0.2194E-01	0.6409E 10	0.5783E 01	0.9163E-04	0.1509E 02	0.1737E 04	0.1936E 04				
10	0.2849E 00	0.2562E 00	0.9365E-01	0.2154E-01	0.2209E-01	0.5707E 10	0.5783E 01	0.1014E-03	0.1509E 02	0.1722E 04	0.1936E 04				
11	0.2853E 00	0.2563E 00	0.9287E-01	0.2228E-01	0.2234E-01	0.5247E 10	0.5783E 01	0.1111E-03	0.1510E 02	0.1712E 04	0.1936E 04				
12	0.2877E 00	0.2554E 00	0.9231E-01	0.2323E-01	0.2274E-01	0.5038E 10	0.5783E 01	0.1194E-03	0.1510E 02	0.1706E 04	0.1936E 04				
13	0.2906E 00	0.2522E 00	0.9168E-01	0.2429E-01	0.2324E-01	0.4896E 10	0.5783E 01	0.1269E-03	0.1511E 02	0.1703E 04	0.1936E 04				
14	0.2936E 00	0.2476E 00	0.9149E-01	0.2534E-01	0.2396E-01	0.4792E 10	0.5783E 01	0.1338E-03	0.1511E 02	0.1702E 04	0.1936E 04				
15	0.2952E 00	0.2417E 00	0.9120E-01	0.2630E-01	0.2474E-01	0.4702E 10	0.5783E 01	0.1401E-03	0.1512E 02	0.1702E 04	0.1936E 04				
16	0.2955E 00	0.2353E 00	0.9123E-01	0.2710E-01	0.2556E-01	0.4616E 10	0.5783E 01	0.1459E-03	0.1512E 02	0.1703E 04	0.1936E 04				
17	0.2955E 00	0.2279E 00	0.9125E-01	0.2777E-01	0.2639E-01	0.4526E 10	0.5783E 01	0.1506E-03	0.1513E 02	0.1704E 04	0.1937E 04				
18	0.2954E 00	0.2206E 00	0.9117E-01	0.2813E-01	0.2710E-01	0.4430E 10	0.5784E 01	0.1552E-03	0.1513E 02	0.1706E 04	0.1937E 04				
19	0.2948E 00	0.2134E 00	0.9096E-01	0.2822E-01	0.2775E-01	0.4329E 10	0.5784E 01	0.1582E-03	0.1514E 02	0.1708E 04	0.1937E 04				
20	0.2936E 00	0.2071E 00	0.9063E-01	0.2816E-01	0.2844E-01	0.4221E 10	0.5784E 01	0.1611E-03	0.1514E 02	0.1710E 04	0.1937E 04				
21	0.2915E 00	0.2021E 00	0.9037E-01	0.2793E-01	0.2898E-01	0.4107E 10	0.5784E 01	0.1638E-03	0.1515E 02	0.1712E 04	0.1937E 04				
22	0.2894E 00	0.1989E 00	0.9008E-01	0.2759E-01	0.2939E-01	0.3986E 10	0.5784E 01	0.1660E-03	0.1515E 02	0.1714E 04	0.1938E 04				
23	0.2879E 00	0.1958E 00	0.8970E-01	0.2702E-01	0.2978E-01	0.3859E 10	0.5784E 01	0.1679E-03	0.1516E 02	0.1716E 04	0.1938E 04				
24	0.2856E 00	0.1926E 00	0.8940E-01	0.2695E-01	0.3009E-01	0.3722E 10	0.5784E 01	0.1697E-03	0.1516E 02	0.1719E 04	0.1938E 04				
25	0.2830E 00	0.1910E 00	0.8892E-01	0.2665E-01	0.3031E-01	0.3591E 10	0.5784E 01	0.1702E-03	0.1517E 02	0.1721E 04	0.1939E 04				
26	0.2809E 00	0.1896E 00	0.8827E-01	0.2628E-01	0.3060E-01	0.3447E 10	0.5783E 01	0.1705E-03	0.1518E 02	0.1723E 04	0.1939E 04				
27	0.2781E 00	0.1876E 00	0.8768E-01	0.2595E-01	0.3076E-01	0.3292E 10	0.5783E 01	0.1700E-03	0.1518E 02	0.1726E 04	0.1939E 04				
28	0.2751E 00	0.1857E 00	0.8707E-01	0.2569E-01	0.3094E-01	0.3126E 10	0.5783E 01	0.1701E-03	0.1519E 02	0.1728E 04	0.1940E 04				
29	0.2717E 00	0.1830E 00	0.8632E-01	0.2550E-01	0.3118E-01	0.2952E 10	0.5783E 01	0.1701E-03	0.1519E 02	0.1730E 04	0.1940E 04				
30	0.2674E 00	0.1800E 00	0.8559E-01	0.2555E-01	0.3139E-01	0.2772E 10	0.5783E 01	0.1699E-03	0.1520E 02	0.1732E 04	0.1941E 04				
31	0.2642E 00	0.1772E 00	0.8481E-01	0.2572E-01	0.3171E-01	0.2585E 10	0.5783E 01	0.1705E-03	0.1520E 02	0.1733E 04	0.1941E 04				
32	0.2613E 00	0.1747E 00	0.8402E-01	0.2583E-01	0.3200E-01	0.2414E 10	0.5783E 01	0.1716E-03	0.1521E 02	0.1735E 04	0.1941E 04				
33	0.2577E 00	0.1720E 00	0.8321E-01	0.2607E-01	0.3238E-01	0.2240E 10	0.5783E 01	0.1741E-03	0.1522E 02	0.1736E 04	0.1942E 04				
34	0.2542E 00	0.1693E 00	0.8240E-01	0.2625E-01	0.3299E-01	0.2063E 10	0.5783E 01	0.1786E-03	0.1522E 02	0.1738E 04	0.1943E 04				
35	0.2503E 00	0.1671E 00	0.8167E-01	0.2641E-01	0.3361E-01	0.1916E 10	0.5783E 01	0.1864E-03	0.1523E 02	0.1739E 04	0.1943E 04				
36	0.2463E 00	0.1650E 00	0.8096E-01	0.2680E-01	0.3431E-01	0.1793E 10	0.5783E 01	0.1968E-03	0.1523E 02	0.1740E 04	0.1944E 04				
37	0.2418E 00	0.1631E 00	0.8038E-01	0.2729E-01	0.3509E-01	0.1670E 10	0.5783E 01	0.2114E-03	0.1524E 02	0.1741E 04	0.1944E 04				
38	0.2368E 00	0.1610E 00	0.7977E-01	0.2791E-01	0.3581E-01	0.1542E 10	0.5783E 01	0.2302E-03	0.1524E 02	0.1742E 04	0.1945E 04				
39	0.2326E 00	0.1584E 00	0.7922E-01	0.2859E-01	0.3660E-01	0.1408E 10	0.5783E 01	0.2547E-03	0.1525E 02	0.1742E 04	0.1946E 04				
40	0.2278E 00	0.1556E 00	0.7881E-01	0.2931E-01	0.3735E-01	0.1286E 10	0.5783E 01	0.2846E-03	0.1526E 02	0.1743E 04	0.1947E 04				
41	0.2222E 00	0.1533E 00	0.7855E-01	0.2983E-01	0.3793E-01	0.1155E 10	0.5783E 01	0.3151E-03	0.1526E 02	0.1744E 04	0.1948E 04				
42	0.2175E 00	0.1491E 00	0.7832E-01	0.3015E-01	0.3844E-01	0.1020E 10	0.5782E 01	0.3501E-03	0.1527E 02	0.1744E 04	0.1949E 04				
43	0.2138E 00	0.1455E 00	0.7807E-01	0.3063E-01	0.3889E-01	0.9313E 09	0.5782E 01	0.3907E-03	0.1527E 02	0.1745E 04	0.1950E 04				
44	0.2102E 00	0.1421E 00	0.7780E-01	0.3116E-01	0.3939E-01	0.8502E 09	0.5782E 01	0.4361E-03	0.1528E 02	0.1745E 04	0.1951E 04				
45	0.2066E 00	0.1385E 00	0.7767E-01	0.3170E-01	0.3982E-01	0.8200E 09	0.5781E 01	0.4878E-03	0.1529E 02	0.1746E 04	0.1952E 04				
46	0.2029E 00	0.1347E 00	0.7756E-01	0.3231E-01	0.4016E-01	0.8076E 09	0.5781E 01	0.5467E-03	0.1529E 02	0.1746E 04	0.1953E 04				
47	0.1997E 00	0.1314E 00	0.7737E-01	0.3290E-01	0.4039E-01	0.7881E 09	0.5780E 01	0.6117E-03	0.1530E 02	0.1746E 04	0.1955E 04				
48	0.1968E 00	0.1287E 00	0.7717E-01	0.3359E-01	0.4055E-01	0.7597E 09	0.5780E 01	0.6841E-03	0.1530E 02	0.1746E 04	0.1956E 04				
49	0.1937E 00	0.1258E 00	0.7693E-01	0.3432E-01	0.4057E-01	0.7238E 09	0.5779E 01	0.7632E-03	0.1531E 02	0.1746E 04	0.1958E 04				

15	0.38500	0.00	0.00	0.00	6.31E-01	5.58E-01	5.18E-01	5.12E-01	5.23E-01	5.50E-01	5.81E-01	5.99E-01	6.06E-01
14	0.36500	0.00	0.00	7.58E-01	6.63E-01	5.62E-01	5.16E-01	5.14E-01	5.38E-01	5.75E-01	6.00E-01	6.10E-01	6.09E-01
13	0.34625	0.00	0.00	7.87E-01	6.68E-01	5.57E-01	5.11E-01	5.19E-01	5.58E-01	5.96E-01	6.15E-01	6.16E-01	6.09E-01
12	0.32750	0.00	0.00	8.21E-01	6.73E-01	5.51E-01	5.08E-01	5.31E-01	5.80E-01	6.14E-01	6.24E-01	6.19E-01	6.05E-01
11	0.29750	0.00	1.04E 00	8.78E-01	6.80E-01	5.43E-01	5.09E-01	5.59E-01	6.12E-01	6.31E-01	6.28E-01	6.12E-01	5.91E-01
10	0.27500	0.00	1.09E 00	9.04E-01	6.76E-01	5.30E-01	5.16E-01	5.83E-01	6.24E-01	6.32E-01	6.20E-01	5.99E-01	5.74E-01
9	0.25750	0.00	1.16E 00	9.21E-01	6.63E-01	5.17E-01	5.26E-01	5.96E-01	6.26E-01	6.26E-01	6.09E-01	5.84E-01	5.56E-01
8	0.24250	1.43E 00	1.23E 00	9.23E-01	6.44E-01	5.07E-01	5.37E-01	6.01E-01	6.21E-01	6.15E-01	5.95E-01	5.68E-01	5.39E-01
7	0.21500	1.43E 00	1.22E 00	8.90E-01	6.09E-01	4.97E-01	5.51E-01	5.92E-01	5.97E-01	5.83E-01	5.59E-01	5.30E-01	5.01E-01
6	0.17500	1.43E 00	1.18E 00	8.18E-01	5.50E-01	4.86E-01	5.29E-01	5.38E-01	5.30E-01	5.12E-01	4.87E-01	4.59E-01	4.31E-01
5	0.13000	1.43E 00	1.10E 00	7.00E-01	4.69E-01	4.40E-01	4.41E-01	4.33E-01	4.21E-01	4.04E-01	3.83E-01	3.60E-01	3.37E-01
4	0.08500	1.43E 00	9.89E-01	5.34E-01	2.92E-01	3.27E-01	3.10E-01	2.99E-01	2.88E-01	2.76E-01	2.61E-01	2.45E-01	2.29E-01
3	0.04500	1.43E 00	8.04E-01	2.70E-01	1.86E-01	1.86E-01	1.71E-01	1.63E-01	1.57E-01	1.50E-01	1.42E-01	1.33E-01	1.24E-01
2	0.01250	1.43E 00	2.23E-01	7.50E-02	5.16E-02	5.16E-02	4.76E-02	4.54E-02	4.36E-02	4.17E-02	3.95E-02	3.71E-02	3.46E-02
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 1.26289 1.46130 1.68153 1.92598 2.19733 2.49852 2.83285 3.16718 3.50150 3.83583 4.17015

0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	5.60E-01	5.99E-01	6.29E-01	6.47E-01	6.54E-01	6.52E-01	6.43E-01	6.29E-01	6.14E-01	6.03E-01	0.00	0.00
19	0.47500	5.93E-01	6.26E-01	6.52E-01	6.68E-01	6.76E-01	6.78E-01	6.74E-01	6.67E-01	6.59E-01	6.49E-01	0.00	0.00
18	0.44750	6.06E-01	6.30E-01	6.48E-01	6.59E-01	6.64E-01	6.64E-01	6.60E-01	6.54E-01	6.47E-01	6.38E-01	0.00	0.00
17	0.42750	6.09E-01	6.27E-01	6.40E-01	6.47E-01	6.49E-01	6.47E-01	6.42E-01	6.36E-01	6.28E-01	6.19E-01	0.00	0.00
16	0.40625	6.11E-01	6.21E-01	6.28E-01	6.31E-01	6.30E-01	6.26E-01	6.19E-01	6.12E-01	6.04E-01	5.94E-01	0.00	0.00
15	0.38500	6.10E-01	6.13E-01	6.14E-01	6.13E-01	6.09E-01	6.02E-01	5.95E-01	5.86E-01	5.77E-01	5.67E-01	0.00	0.00
14	0.36500	6.06E-01	6.03E-01	5.99E-01	5.94E-01	5.87E-01	5.79E-01	5.70E-01	5.60E-01	5.51E-01	5.41E-01	0.00	0.00
13	0.34625	6.00E-01	5.91E-01	5.83E-01	5.75E-01	5.65E-01	5.56E-01	5.46E-01	5.36E-01	5.26E-01	5.15E-01	0.00	0.00
12	0.32750	5.91E-01	5.78E-01	5.66E-01	5.54E-01	5.43E-01	5.32E-01	5.21E-01	5.10E-01	5.00E-01	4.90E-01	0.00	0.00
11	0.29750	5.70E-01	5.51E-01	5.34E-01	5.18E-01	5.04E-01	4.91E-01	4.79E-01	4.68E-01	4.57E-01	4.47E-01	0.00	0.00
10	0.27500	5.49E-01	5.27E-01	5.07E-01	4.89E-01	4.74E-01	4.60E-01	4.47E-01	4.35E-01	4.25E-01	4.15E-01	0.00	0.00
9	0.25750	5.30E-01	5.06E-01	4.84E-01	4.65E-01	4.49E-01	4.34E-01	4.21E-01	4.10E-01	3.99E-01	3.89E-01	0.00	0.00
8	0.24250	5.11E-01	4.86E-01	4.63E-01	4.44E-01	4.27E-01	4.12E-01	3.99E-01	3.87E-01	3.77E-01	3.67E-01	0.00	0.00
7	0.21500	4.72E-01	4.46E-01	4.22E-01	4.02E-01	3.85E-01	3.70E-01	3.57E-01	3.46E-01	3.36E-01	3.27E-01	0.00	0.00
6	0.17500	4.04E-01	3.79E-01	3.56E-01	3.37E-01	3.20E-01	3.06E-01	2.95E-01	2.85E-01	2.76E-01	2.68E-01	0.00	0.00
5	0.13000	3.14E-01	2.93E-01	2.73E-01	2.57E-01	2.43E-01	2.31E-01	2.22E-01	2.14E-01	2.07E-01	2.00E-01	0.00	0.00
4	0.08500	2.13E-01	1.98E-01	1.84E-01	1.72E-01	1.62E-01	1.54E-01	1.47E-01	1.41E-01	1.36E-01	1.32E-01	0.00	0.00
3	0.04500	1.16E-01	1.07E-01	9.93E-02	9.26E-02	8.71E-02	8.26E-02	7.88E-02	7.57E-02	7.30E-02	7.07E-02	0.00	0.00
2	0.01250	3.21E-02	2.97E-02	2.76E-02	2.57E-02	2.42E-02	2.29E-02	2.19E-02	2.10E-02	2.03E-02	1.96E-02	0.00	0.00
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- - - - - DIMENSIONLESS STREAMLINE COORDS - - - - -
0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = 0.00000 0.00000 0.06295 0.12937 0.20308 0.28491 0.37574 0.47656 0.58847 0.71269 0.85058 1.00363

0 J	Y												
11	1.00000	0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	0.00	2.37E-01	2.87E-01	3.57E-01	4.22E-01	4.76E-01	4.84E-01	4.86E-01	4.85E-01	4.84E-01	4.83E-01	4.83E-01
9	0.80000	0.00	2.23E-01	2.64E-01	3.38E-01	4.06E-01	4.56E-01	4.69E-01	4.72E-01	4.71E-01	4.69E-01	4.67E-01	4.66E-01
8	0.70000	0.00	2.09E-01	2.45E-01	3.16E-01	3.87E-01	4.38E-01	4.55E-01	4.58E-01	4.57E-01	4.54E-01	4.51E-01	4.48E-01
7	0.60000	0.00	1.93E-01	2.27E-01	2.94E-01	3.69E-01	4.21E-01	4.40E-01	4.44E-01	4.42E-01	4.39E-01	4.34E-01	4.30E-01
6	0.50000	0.00	1.77E-01	2.09E-01	2.72E-01	3.50E-01	4.04E-01	4.26E-01	4.30E-01	4.28E-01	4.23E-01	4.16E-01	4.10E-01
5	0.40000	0.00	1.57E-01	1.89E-01	2.51E-01	3.29E-01	3.87E-01	4.11E-01	4.15E-01	4.12E-01	4.05E-01	3.97E-01	3.88E-01
4	0.30000	0.00	1.36E-01	1.68E-01	2.29E-01	3.08E-01	3.68E-01	3.94E-01	3.99E-01	3.94E-01	3.85E-01	3.74E-01	3.62E-01
3	0.20000	0.00	1.10E-01	1.42E-01	2.04E-01	2.84E-01	3.48E-01	3.77E-01	3.81E-01	3.74E-01	3.62E-01	3.47E-01	3.31E-01
2	0.10000	0.00	7.75E-02	1.09E-01	1.76E-01	2.59E-01	3.26E-01	3.57E-01	3.60E-01	3.49E-01	3.31E-01	3.09E-01	2.89E-01
1	0.00000	0.00	0.00	2.51E-02	1.32E-01	2.25E-01	2.99E-01	3.32E-01	3.33E-01	3.11E-01	2.81E-01	2.45E-01	1.97E-01

RADIAL POSITION 2R/D

0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
X 0.00	0.....+	.....+.	.....+2	.....+4	.....+6	.....+8	.....+1	.....+	.....+	.....+	0.00
X 0.02	.	0		2	4	6	8	1			. 0.02
X 0.04	.		0		2	4	6	8	1		. 0.04
X 0.06	.			0		2	4	6	8	1	. 0.06
X 0.08	.				0		2	4	6	8	1 0.08
X 0.10	+						0	2	4	6	8 1 0.10
X 0.12	.						0	2	4	6	8 1 0.12
X 0.14	.						0	2	4	6	8 1 0.14
X 0.16	.										. 0.16
X 0.18	.					0		2	4	6	8 1 0.18
X 0.20	+										+ 0.20
X 0.22	.				0			2	4	6	8 1 0.22
X 0.24	.										. 0.24
X 0.26	.			0			2		4	6	8 1 0.26
X 0.28	.										. 0.28
X 0.30	+		0				2		4	6	8 1 0.30
X 0.32	.										. 0.32
X 0.34	0						2		4	6	8 1 0.34
X 0.36	.										. 0.36
X 0.38	.										. 0.38
X 0.40	0						2		4	6	8 1 0.40
X 0.42	.										. 0.42
X 0.44	.										. 0.44
X 0.46	0						2		4	6	8 1 0.46

	5	4	3	2	1	0	5	4	3	2	1	0	5	4	3	2	1	0	5	4	3	2	1	0	5	4	3	2	1	0	5	4	3	2	1	0
5	0.01625	3.52E-01	1.62E 00	2.66E 00	3.45E 00	4.02E 00	4.41E 00	4.68E 00	4.83E 00	4.91E 00	4.92E 00	4.92E 00																								
4	0.01062	-8.26E-01	6.09E-01	1.82E 00	2.76E 00	3.45E 00	3.94E 00	4.27E 00	4.46E 00	4.56E 00	4.59E 00	4.59E 00																								
3	0.00562	-1.49E 00	3.93E-02	1.34E 00	2.37E 00	3.13E 00	3.67E 00	4.04E 00	4.25E 00	4.37E 00	4.40E 00	4.40E 00																								
2	0.00156	-1.73E 00	-1.69E-01	1.17E 00	2.23E 00	3.02E 00	3.57E 00	3.95E 00	4.18E 00	4.30E 00	4.34E 00	4.33E 00																								
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																								
0	I =												V VELOCITY																							
0	X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552																																			
0	J Y																																			
21	0.06250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
20	0.06062	0.00	0.00	0.00	0.00	1.51E 00	9.29E-01	1.57E-01	-8.97E-02	-1.20E-01	-9.13E-02	-7.35E-02	-6.74E-02																							
19	0.05766	0.00	0.00	0.00	0.00	4.88E 00	2.12E 00	3.32E-01	-2.59E-01	-3.35E-01	-2.85E-01	-2.43E-01	-2.04E-01																							
18	0.05469	0.00	0.00	0.00	0.00	9.32E 00	3.02E 00	3.61E-01	-5.05E-01	-6.19E-01	-5.43E-01	-4.44E-01	-3.51E-01																							
17	0.05211	0.00	0.00	0.00	5.43E 00	9.20E 00	3.40E 00	2.59E-01	-7.87E-01	-9.19E-01	-7.83E-01	-6.16E-01	-4.73E-01																							
16	0.04945	0.00	0.00	0.00	1.05E 01	9.68E 00	3.66E 00	1.10E-01	-1.10E 00	-1.22E 00	-9.98E-01	-7.67E-01	-5.85E-01																							
15	0.04687	0.00	0.00	0.00	1.57E 01	1.01E 01	3.67E 00	-1.59E-01	-1.40E 00	-1.44E 00	-1.15E 00	-8.81E-01	-6.75E-01																							
14	0.04445	0.00	0.00	6.65E 00	1.53E 01	1.01E 01	3.40E 00	-5.01E-01	-1.63E 00	-1.57E 00	-1.24E 00	-9.58E-01	-7.44E-01																							
13	0.04211	0.00	0.00	1.20E 01	1.57E 01	1.01E 01	2.98E 00	-8.33E-01	-1.77E 00	-1.63E 00	-1.29E 00	-1.01E 00	-7.96E-01																							
12	0.03906	0.00	0.00	1.89E 01	1.67E 01	9.72E 00	2.21E 00	-1.23E 00	-1.84E 00	-1.63E 00	-1.31E 00	-1.05E 00	-8.47E-01																							
11	0.03578	0.00	7.83E 00	2.00E 01	1.73E 01	8.76E 00	9.42E-01	-1.43E 00	-1.73E 00	-1.54E 00	-1.27E 00	-1.06E 00	-8.70E-01																							
10	0.03328	0.00	1.39E 01	2.14E 01	1.73E 01	7.37E 00	2.21E-01	-1.42E 00	-1.60E 00	-1.44E 00	-1.22E 00	-1.04E 00	-8.72E-01																							
9	0.03125	0.00	1.98E 01	2.23E 01	1.70E 01	6.01E 00	-2.28E-01	-1.35E 00	-1.47E 00	-1.35E 00	-1.17E 00	-1.02E 00	-8.64E-01																							
8	0.02859	0.00	1.88E 01	2.26E 01	1.61E 01	4.13E 00	-6.69E-01	-1.23E 00	-1.30E 00	-1.22E 00	-1.10E 00	-9.81E-01	-8.45E-01																							
7	0.02437	0.00	1.83E 01	2.22E 01	1.36E 01	9.20E-01	-9.17E-01	-1.00E 00	-1.03E 00	-1.01E 00	-9.66E-01	-8.93E-01	-7.87E-01																							
6	0.01906	0.00	1.84E 01	2.05E 01	7.78E 00	-1.30E 00	-9.30E-01	-7.57E-01	-7.36E-01	-7.65E-01	-7.73E-01	-7.44E-01	-6.68E-01																							
5	0.01344	0.00	1.86E 01	1.59E 01	-6.78E-02	-8.46E-01	-7.17E-01	-5.34E-01	-4.88E-01	-5.19E-01	-5.52E-01	-5.49E-01	-5.01E-01																							
4	0.00812	0.00	1.77E 01	4.88E 00	-9.43E-01	-5.60E-01	-4.55E-01	-3.28E-01	-2.86E-01	-3.06E-01	-3.34E-01	-3.41E-01	-3.13E-01																							
3	0.00359	0.00	1.07E 01	-3.57E-01	-5.85E-01	-2.67E-01	-2.06E-01	-1.46E-01	-1.25E-01	-1.34E-01	-1.48E-01	-1.53E-01	-1.41E-01																							
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																							
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																							
0	I =												13 14 15 16 17 18 19 20 21 22 23																							
0	X = 0.15786 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127																																			
0	J Y																																			
21	0.06250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
20	0.06062	-5.50E-02	-3.73E-02	-2.17E-02	-1.15E-02	-6.04E-03	-3.52E-03	-1.89E-03	-9.93E-04	6.94E-04	9.54E-05	0.00																								
19	0.05766	-1.54E-01	-1.01E-01	-5.79E-02	-3.00E-02	-1.44E-02	-6.31E-03	-1.01E-03	2.05E-03	4.73E-03	2.00E-04	0.00																								
18	0.05469	-2.56E-01	-1.66E-01	-9.68E-02	-5.16E-02	-2.56E-02	-1.15E-02	-2.13E-03	3.35E-03	7.28E-03	2.67E-04	0.00																								
17	0.05211	-3.41E-01	-2.23E-01	-1.32E-01	-7.19E-02	-3.70E-02	-1.76E-02	-4.54E-03	3.11E-03	8.36E-03	3.14E-04	0.00																								
16	0.04945	-4.23E-01	-2.79E-01	-1.67E-01	-9.38E-02	-5.01E-02	-2.52E-02	-8.26E-03	1.63E-03	8.46E-03	3.52E-04	0.00																								
15	0.04687	-4.93E-01	-3.29E-01	-2.01E-01	-1.15E-01	-6.35E-02	-3.34E-02	-1.27E-02	-6.51E-04	7.81E-03	3.81E-04	0.00																								
14	0.04445	-5.50E-01	-3.71E-01	-2.30E-01	-1.35E-01	-7.60E-02	-4.13E-02	-1.73E-02	-3.29E-03	6.74E-03	4.00E-04	0.00																								
13	0.04211	-5.96E-01	-4.07E-01	-2.56E-01	-1.53E-01	-8.78E-02	-4.90E-02	-2.19E-02	-6.08E-03	5.43E-03	4.12E-04	0.00																								
12	0.03906	-6.44E-01	-4.47E-01	-2.87E-01	-1.74E-01	-1.02E-01	-5.86E-02	-2.79E-02	-9.85E-03	3.49E-03	4.16E-04	0.00																								
11	0.03578	-6.73E-01	-4.75E-01	-3.10E-01	-1.91E-01	-1.15E-01	-6.71E-02	-3.34E-02	-1.36E-02	1.36E-03	4.01E-04	0.00																								
10	0.03328	-6.83E-01	-4.88E-01	-3.22E-01	-2.01E-01	-1.22E-01	-7.22E-02	-3.69E-02	-1.60E-02	-1.70E-04	3.80E-04	0.00																								
9	0.03125	-6.83E-01	-4.93E-01	-3.28E-01	-2.06E-01	-1.26E-01	-7.55E-02	-3.92E-02	-1.77E-02	-1.30E-03	3.57E-04	0.00																								
8	0.02859	-6.76E-01	-4.93E-01	-3.32E-01	-2.11E-01	-1.30E-01	-7.8																													

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0	J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	0.00	2.71E-01	4.55E-01	4.90E-01	4.68E-01	4.36E-01	4.08E-01	3.83E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	3.68E-01	5.11E-01	5.34E-01	5.09E-01	4.73E-01	4.37E-01	4.03E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	4.68E-01	5.64E-01	5.66E-01	5.31E-01	4.85E-01	4.40E-01	4.00E-01
17	0.42750	0.00	0.00	0.00	0.00	6.31E-01	5.55E-01	5.88E-01	5.69E-01	5.23E-01	4.71E-01	4.24E-01	3.88E-01
16	0.40625	0.00	0.00	0.00	0.00	5.42E-01	5.40E-01	5.51E-01	5.26E-01	4.80E-01	4.33E-01	3.97E-01	3.69E-01
15	0.38500	0.00	0.00	0.00	0.00	5.37E-01	5.28E-01	5.01E-01	4.57E-01	4.14E-01	3.83E-01	3.62E-01	3.45E-01
14	0.36500	0.00	0.00	0.00	7.39E-01	5.76E-01	5.00E-01	4.29E-01	3.73E-01	3.44E-01	3.33E-01	3.26E-01	3.19E-01
13	0.34625	0.00	0.00	0.00	5.76E-01	5.27E-01	4.38E-01	3.42E-01	2.89E-01	2.80E-01	2.86E-01	2.92E-01	2.92E-01
12	0.32750	0.00	0.00	0.00	5.23E-01	4.96E-01	3.74E-01	2.54E-01	2.10E-01	2.20E-01	2.41E-01	2.56E-01	2.64E-01
11	0.29750	0.00	0.00	5.99E-01	5.40E-01	4.57E-01	2.73E-01	1.12E-01	1.00E-01	1.37E-01	1.74E-01	2.00E-01	2.17E-01
10	0.27500	0.00	0.00	5.53E-01	5.50E-01	4.02E-01	1.32E-01	1.62E-02	3.55E-02	8.28E-02	1.26E-01	1.57E-01	1.80E-01
9	0.25750	0.00	0.00	6.26E-01	5.60E-01	3.43E-01	4.44E-02	-3.93E-02	-7.21E-03	4.39E-02	8.94E-02	1.25E-01	1.52E-01
8	0.24250	0.00	1.00E 00	7.36E-01	5.55E-01	2.79E-01	-2.04E-02	-7.75E-02	-3.96E-02	1.25E-02	5.94E-02	9.70E-02	1.28E-01
7	0.21500	0.00	1.00E 00	7.80E-01	5.21E-01	1.72E-01	-1.20E-01	-1.31E-01	-9.06E-02	-4.02E-02	7.05E-03	4.79E-02	8.37E-02
6	0.17500	0.00	1.00E 00	7.85E-01	4.25E-01	-6.44E-02	-2.04E-01	-1.89E-01	-1.53E-01	-1.08E-01	-6.24E-02	-1.85E-02	2.36E-02
5	0.13000	0.00	1.00E 00	7.12E-01	1.75E-01	-3.27E-01	-2.76E-01	-2.43E-01	-2.10E-01	-1.71E-01	-1.28E-01	-8.23E-02	-3.49E-02
4	0.08500	0.00	1.00E 00	5.12E-01	-3.29E-01	-3.66E-01	-3.25E-01	-2.86E-01	-2.53E-01	-2.18E-01	-1.78E-01	-1.30E-01	-7.92E-02
3	0.04500	0.00	1.00E 00	-3.64E-02	-4.63E-01	-3.99E-01	-3.53E-01	-3.11E-01	-2.77E-01	-2.44E-01	-2.05E-01	-1.57E-01	-1.04E-01
2	0.01250	0.00	1.00E 00	-5.69E-01	-5.14E-01	-4.14E-01	-3.63E-01	-3.20E-01	-2.85E-01	-2.53E-01	-2.14E-01	-1.67E-01	-1.13E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299

0	J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	3.58E-01	3.36E-01	3.19E-01	3.07E-01	3.01E-01	2.97E-01	2.95E-01	2.93E-01	2.93E-01	2.93E-01	2.93E-01	2.93E-01
19	0.47500	3.72E-01	3.47E-01	3.29E-01	3.18E-01	3.12E-01	3.08E-01	3.07E-01	3.08E-01	3.09E-01	3.11E-01	3.11E-01	3.11E-01
18	0.44750	3.69E-01	3.45E-01	3.28E-01	3.16E-01	3.09E-01	3.05E-01	3.03E-01	3.03E-01	3.03E-01	3.04E-01	3.04E-01	3.04E-01
17	0.42750	3.60E-01	3.38E-01	3.23E-01	3.12E-01	3.04E-01	3.00E-01	2.97E-01	2.96E-01	2.95E-01	2.96E-01	2.96E-01	2.96E-01
16	0.40625	3.47E-01	3.28E-01	3.14E-01	3.04E-01	2.97E-01	2.92E-01	2.89E-01	2.87E-01	2.86E-01	2.86E-01	2.86E-01	2.86E-01
15	0.38500	3.29E-01	3.15E-01	3.04E-01	2.95E-01	2.88E-01	2.83E-01	2.80E-01	2.78E-01	2.77E-01	2.76E-01	2.76E-01	2.76E-01
14	0.36500	3.09E-01	3.00E-01	2.91E-01	2.84E-01	2.78E-01	2.74E-01	2.71E-01	2.69E-01	2.67E-01	2.66E-01	2.66E-01	2.66E-01
13	0.34625	2.89E-01	2.84E-01	2.78E-01	2.73E-01	2.68E-01	2.65E-01	2.62E-01	2.60E-01	2.58E-01	2.57E-01	2.57E-01	2.57E-01
12	0.32750	2.67E-01	2.66E-01	2.64E-01	2.61E-01	2.57E-01	2.55E-01	2.52E-01	2.50E-01	2.49E-01	2.48E-01	2.48E-01	2.48E-01
11	0.29750	2.28E-01	2.35E-01	2.38E-01	2.39E-01	2.39E-01	2.38E-01	2.36E-01	2.35E-01	2.34E-01	2.33E-01	2.33E-01	2.33E-01
10	0.27500	1.98E-01	2.10E-01	2.18E-01	2.22E-01	2.24E-01	2.24E-01	2.24E-01	2.24E-01	2.24E-01	2.23E-01	2.22E-01	2.22E-01
9	0.25750	1.74E-01	1.90E-01	2.01E-01	2.08E-01	2.12E-01	2.14E-01	2.15E-01	2.15E-01	2.15E-01	2.14E-01	2.14E-01	2.14E-01
8	0.24250	1.53E-01	1.73E-01	1.87E-01	1.96E-01	2.02E-01	2.05E-01	2.07E-01	2.08E-01	2.08E-01	2.07E-01	2.07E-01	2.07E-01
7	0.21500	1.15E-01	1.42E-01	1.61E-01	1.75E-01	1.84E-01	1.90E-01	1.93E-01	1.95E-01	1.95E-01	1.95E-01	1.95E-01	1.95E-01
6	0.17500	6.30E-02	9.75E-02	1.25E-01	1.45E-01	1.59E-01	1.68E-01	1.74E-01	1.78E-01	1.79E-01	1.79E-01	1.79E-01	1.79E-01
5	0.13000	1.17E-02	5.39E-02	8.86E-02	1.15E-01	1.34E-01	1.47E-01	1.56E-01	1.61E-01	1.64E-01	1.64E-01	1.64E-01	1.64E-01
4	0.08500	-2.75E-02	2.03E-02	6.06E-02	9.21E-02	1.15E-01	1.31E-01	1.42E-01	1.49E-01	1.52E-01	1.53E-01	1.53E-01	1.53E-01
3	0.04500	-4.96E-02	1.31E-03	4.48E-02	7.91E-02	1.04E-01	1.22E-01	1.35E-01	1.42E-01	1.46E-01	1.47E-01	1.47E-01	1.47E-01
2	0.01250	-5.76E-02	-5.62E-03	3.90E-02	7.43E-02	1.01E-01	1.19E-01	1.32E-01	1.39E-01	1.43E-01	1.45E-01	1.44E-01	1.44E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- - - - - DIMENSIONLESS V VELOCITY - - - - -

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415

0	J	Y											
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	0.00	0.00	0.00	0.00	5.04E-02	3.10E-02	5.24E-03	-2.99E-03	-3.99E-03	-3.04E-03	-2.45E-03	-2.25E-03

4	1.643E-01	4.706E-03
5	2.419E-01	2.692E-03
6	3.280E-01	2.954E-03
7	4.235E-01	2.992E-03
8	5.296E-01	2.811E-03
9	6.473E-01	2.610E-03
10	7.780E-01	2.542E-03
11	9.231E-01	2.761E-03
12	1.084E 00	3.111E-03
13	1.263E 00	3.359E-03
14	1.461E 00	3.464E-03
15	1.682E 00	3.455E-03
16	1.926E 00	3.374E-03
17	2.197E 00	3.253E-03
18	2.499E 00	3.112E-03
19	2.833E 00	2.967E-03
20	3.167E 00	2.831E-03
21	3.502E 00	2.705E-03
22	3.836E 00	2.651E-03

0- - - - -

1X-AXIS IS XI
Y-AXES ARE
SYMBOL
MAXIMUM VALUES

	00	02	04	06	08	10
	0	2	4	6	8	1
0.360E 00	0.395E 00	0.424E 00	0.450E 00	0.474E 00	0.500E 00	

RADIAL POSITION R/D

0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
X 0.00	0	2	4	6	8	1	3	5	7	9	11	0.00
X 0.02	.	0	2	4	6	8	1	3	5	7	9	0.02
X 0.04	.	.	0	2	4	6	8	1	3	5	7	0.04
X 0.06	.	.	.	0	2	4	6	8	1	3	5	0.06
X 0.08	.	.	.	.	0	2	4	6	8	1	3	0.08
X 0.10	+	.	.	.	.	0	2	4	6	8	1	0.10
X 0.12	.	.	.	.	.	.	0	2	4	6	8	0.12

157	0.4580E-01	0.1720E-01	0.1883E-01	0.6509E-02	0.4624E-02	0.1097E	09	0.5621E	01	0.4831E-02	0.1479E	02	0.1563E	04	0.1933E	04
158	0.4456E-01	0.1717E-01	0.1897E-01	0.6525E-02	0.4592E-02	0.1092E	09	0.5629E	01	0.4695E-02	0.1479E	02	0.1564E	04	0.1933E	04
159	0.4333E-01	0.1714E-01	0.1909E-01	0.6559E-02	0.4563E-02	0.1088E	09	0.5636E	01	0.4554E-02	0.1480E	02	0.1565E	04	0.1933E	04
160	0.4214E-01	0.1706E-01	0.1921E-01	0.6614E-02	0.4530E-02	0.1089E	09	0.5643E	01	0.4408E-02	0.1480E	02	0.1566E	04	0.1933E	04
161	0.4096E-01	0.1698E-01	0.1932E-01	0.6639E-02	0.4493E-02	0.1083E	09	0.5650E	01	0.4257E-02	0.1481E	02	0.1566E	04	0.1933E	04
162	0.3981E-01	0.1688E-01	0.1942E-01	0.6666E-02	0.4453E-02	0.1081E	09	0.5657E	01	0.4102E-02	0.1481E	02	0.1567E	04	0.1933E	04
163	0.3869E-01	0.1677E-01	0.1951E-01	0.6736E-02	0.4410E-02	0.1074E	09	0.5664E	01	0.3945E-02	0.1482E	02	0.1568E	04	0.1933E	04
164	0.3758E-01	0.1666E-01	0.1959E-01	0.6768E-02	0.4364E-02	0.1071E	09	0.5670E	01	0.3785E-02	0.1483E	02	0.1568E	04	0.1932E	04
165	0.3651E-01	0.1654E-01	0.1966E-01	0.6785E-02	0.4318E-02	0.1070E	09	0.5677E	01	0.3623E-02	0.1483E	02	0.1569E	04	0.1932E	04
166	0.3547E-01	0.1643E-01	0.1972E-01	0.6848E-02	0.4269E-02	0.1065E	09	0.5683E	01	0.3462E-02	0.1484E	02	0.1570E	04	0.1932E	04
167	0.3444E-01	0.1633E-01	0.1977E-01	0.6888E-02	0.4218E-02	0.1059E	09	0.5689E	01	0.3301E-02	0.1484E	02	0.1570E	04	0.1932E	04
168	0.3346E-01	0.1624E-01	0.1981E-01	0.6943E-02	0.4166E-02	0.1058E	09	0.5694E	01	0.3139E-02	0.1485E	02	0.1571E	04	0.1932E	04
169	0.3249E-01	0.1617E-01	0.1985E-01	0.6958E-02	0.4112E-02	0.1050E	09	0.5700E	01	0.2979E-02	0.1485E	02	0.1572E	04	0.1932E	04
170	0.3156E-01	0.1608E-01	0.1987E-01	0.6999E-02	0.4056E-02	0.1047E	09	0.5705E	01	0.2820E-02	0.1486E	02	0.1572E	04	0.1931E	04
171	0.3066E-01	0.1603E-01	0.1988E-01	0.7053E-02	0.4000E-02	0.1041E	09	0.5710E	01	0.2663E-02	0.1486E	02	0.1573E	04	0.1931E	04
172	0.2978E-01	0.1597E-01	0.1988E-01	0.7087E-02	0.3941E-02	0.1033E	09	0.5715E	01	0.2509E-02	0.1487E	02	0.1574E	04	0.1931E	04
173	0.2901E-01	0.1595E-01	0.1987E-01	0.7130E-02	0.3824E-02	0.9474E	08	0.5720E	01	0.2365E-02	0.1487E	02	0.1574E	04	0.1931E	04
174	0.2825E-01	0.1592E-01	0.1985E-01	0.7189E-02	0.3730E-02	0.9280E	08	0.5724E	01	0.2228E-02	0.1488E	02	0.1575E	04	0.1931E	04
175	0.2753E-01	0.1589E-01	0.1983E-01	0.7218E-02	0.3651E-02	0.9312E	08	0.5729E	01	0.2094E-02	0.1489E	02	0.1576E	04	0.1931E	04
176	0.2682E-01	0.1587E-01	0.1979E-01	0.7274E-02	0.3579E-02	0.9329E	08	0.5733E	01	0.1964E-02	0.1489E	02	0.1576E	04	0.1931E	04
177	0.2613E-01	0.1584E-01	0.1975E-01	0.7321E-02	0.3512E-02	0.9313E	08	0.5737E	01	0.1836E-02	0.1490E	02	0.1577E	04	0.1931E	04
178	0.2547E-01	0.1582E-01	0.1970E-01	0.7366E-02	0.3452E-02	0.9274E	08	0.5740E	01	0.1711E-02	0.1490E	02	0.1578E	04	0.1931E	04
179	0.2481E-01	0.1583E-01	0.1964E-01	0.7355E-02	0.3394E-02	0.9271E	08	0.5744E	01	0.1590E-02	0.1491E	02	0.1578E	04	0.1931E	04
180	0.2418E-01	0.1586E-01	0.1958E-01	0.7390E-02	0.3338E-02	0.9193E	08	0.5747E	01	0.1472E-02	0.1492E	02	0.1579E	04	0.1931E	04
181	0.2358E-01	0.1588E-01	0.1951E-01	0.7393E-02	0.3285E-02	0.9151E	08	0.5750E	01	0.1357E-02	0.1492E	02	0.1579E	04	0.1931E	04
182	0.2300E-01	0.1591E-01	0.1943E-01	0.7411E-02	0.3233E-02	0.9080E	08	0.5753E	01	0.1247E-02	0.1493E	02	0.1580E	04	0.1931E	04
183	0.2244E-01	0.1592E-01	0.1935E-01	0.7448E-02	0.3181E-02	0.9023E	08	0.5756E	01	0.1141E-02	0.1493E	02	0.1581E	04	0.1931E	04
184	0.2190E-01	0.1594E-01	0.1926E-01	0.7432E-02	0.3130E-02	0.8970E	08	0.5758E	01	0.1040E-02	0.1494E	02	0.1581E	04	0.1932E	04
185	0.2138E-01	0.1596E-01	0.1916E-01	0.7425E-02	0.3080E-02	0.8898E	08	0.5761E	01	0.9426E-03	0.1495E	02	0.1582E	04	0.1932E	04
186	0.2088E-01	0.1598E-01	0.1906E-01	0.7453E-02	0.3030E-02	0.8812E	08	0.5763E	01	0.8503E-03	0.1495E	02	0.1582E	04	0.1932E	04
187	0.2041E-01	0.1600E-01	0.1896E-01	0.7455E-02	0.2978E-02	0.8739E	08	0.5765E	01	0.7637E-03	0.1496E	02	0.1583E	04	0.1932E	04
188	0.1997E-01	0.1602E-01	0.1885E-01	0.7419E-02	0.2928E-02	0.8668E	08	0.5767E	01	0.6815E-03	0.1497E	02	0.1583E	04	0.1932E	04
189	0.1954E-01	0.1604E-01	0.1873E-01	0.7391E-02	0.2879E-02	0.8612E	08	0.5769E	01	0.6044E-03	0.1497E	02	0.1584E	04	0.1932E	04
190	0.1912E-01	0.1603E-01	0.1862E-01	0.7394E-02	0.2829E-02	0.8532E	08	0.5771E	01	0.5318E-03	0.1498E	02	0.1585E	04	0.1933E	04
191	0.1873E-01	0.1603E-01	0.1849E-01	0.7404E-02	0.2779E-02	0.8449E	08	0.5772E	01	0.4648E-03	0.1498E	02	0.1585E	04	0.1933E	04
192	0.1837E-01	0.1601E-01	0.1837E-01	0.7383E-02	0.2728E-02	0.8379E	08	0.5774E	01	0.4021E-03	0.1499E	02	0.1586E	04	0.1933E	04
193	0.1801E-01	0.1599E-01	0.1824E-01	0.7330E-02	0.2678E-02	0.8300E	08	0.5775E	01	0.3438E-03	0.1500E	02	0.1586E	04	0.1933E	04
194	0.1768E-01	0.1595E-01	0.1811E-01	0.7348E-02	0.2632E-02	0.8242E	08	0.5776E	01	0.2904E-03	0.1500E	02	0.1587E	04	0.1934E	04
195	0.1735E-01	0.1590E-01	0.1797E-01	0.7280E-02	0.2583E-02	0.8177E	08	0.5777E	01	0.2423E-03	0.1501E	02	0.1587E	04	0.1934E	04
196	0.1706E-01	0.1584E-01	0.1784E-01	0.7306E-02	0.2537E-02	0.8074E	08	0.5778E	01	0.1976E-03	0.1502E	02	0.1588E	04	0.1934E	04
197	0.1676E-01	0.1578E-01	0.1770E-01	0.7258E-02	0.2490E-02	0.8033E	08	0.5779E	01	0.1575E-03	0.1502E	02	0.1588E	04	0.1934E	04
198	0.1650E-01	0.1571E-01	0.1756E-01	0.7239E-02	0.2443E-02	0.7916E	08	0.5780E	01	0.1215E-03	0.1503E	02	0.1589E	04	0.1935E	04
199	0.1624E-01	0.1563E-01	0.1742E-01	0.7202E-02	0.2400E-02	0.7870E	08	0.5781E	01	0.8936E-04	0.1504E	02	0.1589E	04	0.1935E	04
200	0.1600E-01	0.1554E-01	0.1728E-01	0.7188E-02	0.2356E-02	0.7766E	08	0.5781E	01	0.6010E-04	0.1504E	02	0.1590E	04	0.1935E	04

0-

SWIRL CASE WITH LFS = 5
AND NSBR = 0

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 1.500

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 65.000

4	0.01062	4.49E 05	9.90E 04	8.28E 04	1.27E 04	6.94E 03	6.59E 03	6.90E 03	7.37E 03	7.66E 03	7.51E 03	6.81E 03	5.72E 03
3	0.00562	4.49E 05	1.29E 05	3.28E 04	8.65E 03	6.19E 03	5.99E 03	6.25E 03	6.64E 03	6.89E 03	6.78E 03	6.21E 03	5.26E 03
2	0.00156	4.49E 05	1.56E 05	2.12E 04	7.11E 03	5.82E 03	5.70E 03	5.95E 03	6.30E 03	6.52E 03	6.42E 03	5.91E 03	5.02E 03
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127	
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	4.77E 03	4.38E 03	3.84E 03	3.33E 03	2.91E 03	2.57E 03	2.31E 03	2.11E 03	1.95E 03	1.94E 03	4.49E 05	
19	0.05937	4.37E 03	3.82E 03	3.18E 03	2.59E 03	2.11E 03	1.73E 03	1.45E 03	1.25E 03	1.11E 03	1.22E 03	4.49E 05	
18	0.05594	4.56E 03	3.76E 03	2.96E 03	2.29E 03	1.77E 03	1.37E 03	1.09E 03	8.89E 02	7.51E 02	9.10E 02	4.49E 05	
17	0.05344	4.86E 03	3.85E 03	2.95E 03	2.21E 03	1.66E 03	1.25E 03	9.68E 02	7.74E 02	6.40E 02	8.22E 02	4.49E 05	
16	0.05078	5.25E 03	4.02E 03	2.99E 03	2.20E 03	1.61E 03	1.19E 03	9.05E 02	7.13E 02	5.82E 02	7.81E 02	4.49E 05	
15	0.04812	5.63E 03	4.20E 03	3.06E 03	2.21E 03	1.59E 03	1.16E 03	8.71E 02	6.80E 02	5.50E 02	7.60E 02	4.49E 05	
14	0.04562	5.94E 03	4.36E 03	3.13E 03	2.22E 03	1.59E 03	1.15E 03	8.52E 02	6.61E 02	5.32E 02	7.46E 02	4.49E 05	
13	0.04328	6.17E 03	4.48E 03	3.18E 03	2.24E 03	1.59E 03	1.14E 03	8.40E 02	6.48E 02	5.20E 02	7.34E 02	4.49E 05	
12	0.04094	6.34E 03	4.56E 03	3.22E 03	2.25E 03	1.58E 03	1.13E 03	8.29E 02	6.37E 02	5.11E 02	7.19E 02	4.49E 05	
11	0.03719	6.47E 03	4.63E 03	3.24E 03	2.25E 03	1.57E 03	1.11E 03	8.12E 02	6.21E 02	4.96E 02	6.91E 02	4.49E 05	
10	0.03437	6.45E 03	4.61E 03	3.21E 03	2.22E 03	1.55E 03	1.09E 03	7.96E 02	6.07E 02	4.84E 02	6.65E 02	4.49E 05	
9	0.03219	6.38E 03	4.55E 03	3.17E 03	2.20E 03	1.53E 03	1.07E 03	7.81E 02	5.95E 02	4.73E 02	6.42E 02	4.49E 05	
8	0.03031	6.27E 03	4.49E 03	3.13E 03	2.16E 03	1.50E 03	1.06E 03	7.67E 02	5.84E 02	4.64E 02	6.21E 02	4.49E 05	
7	0.02687	6.02E 03	4.32E 03	3.02E 03	2.09E 03	1.45E 03	1.02E 03	7.39E 02	5.61E 02	4.45E 02	5.81E 02	4.49E 05	
6	0.02187	5.56E 03	4.02E 03	2.82E 03	1.95E 03	1.36E 03	9.55E 02	6.93E 02	5.25E 02	4.15E 02	5.20E 02	4.49E 05	
5	0.01625	4.99E 03	3.65E 03	2.58E 03	1.79E 03	1.25E 03	8.84E 02	6.42E 02	4.87E 02	3.84E 02	4.58E 02	4.49E 05	
4	0.01062	4.49E 03	3.33E 03	2.37E 03	1.66E 03	1.16E 03	8.24E 02	6.00E 02	4.55E 02	3.59E 02	4.09E 02	4.49E 05	
3	0.00562	4.16E 03	3.12E 03	2.24E 03	1.58E 03	1.11E 03	7.90E 02	5.7					

	2	0.01250	5.23E-02	4.41E-02	3.60E-02	2.87E-02	2.27E-02	1.81E-02	1.47E-02	1.22E-02	1.05E-02	1.12E-02	3.00E-02
	1-	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0*	-	-	-	-	-	-	-	-	-	-	-	-	-
0	I =	2	3	4	5	6	7	8	9	10	11	12	13
	X =	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552	0.15786
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	2.10E-01	2.07E-01	2.05E-01	2.17E-01	2.68E-01	3.20E-01	3.38E-01	3.33E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	1.95E-01	2.03E-01	2.19E-01	2.71E-01	3.83E-01	4.90E-01	5.45E-01	5.57E-01
17	0.05344	0.00	0.00	5.10E-02	1.34E-01	1.68E-01	1.96E-01	2.36E-01	3.20E-01	4.45E-01	5.57E-01	6.28E-01	6.57E-01
16	0.05078	0.00	0.00	1.78E-01	1.74E-01	1.89E-01	2.18E-01	2.78E-01	3.80E-01	4.99E-01	6.08E-01	6.87E-01	7.30E-01
15	0.04812	0.00	0.00	1.78E-01	1.65E-01	1.95E-01	2.50E-01	3.33E-01	4.36E-01	5.44E-01	6.47E-01	7.30E-01	7.84E-01
14	0.04562	0.00	5.10E-02	1.05E-01	1.50E-01	2.14E-01	2.96E-01	3.86E-01	4.81E-01	5.81E-01	6.80E-01	7.65E-01	8.24E-01
13	0.04328	0.00	1.60E-01	1.31E-01	1.71E-01	2.54E-01	3.44E-01	4.30E-01	5.19E-01	6.14E-01	7.10E-01	7.94E-01	8.57E-01
12	0.04094	0.00	1.60E-01	1.15E-01	1.83E-01	2.96E-01	3.91E-01	4.71E-01	5.55E-01	6.46E-01	7.39E-01	8.22E-01	8.87E-01
11	0.03719	7.64E-02	6.63E-02	9.40E-02	2.09E-01	3.75E-01	4.62E-01	5.30E-01	6.09E-01	6.96E-01	7.85E-01	8.66E-01	9.32E-01
10	0.03437	1.60E-01	5.80E-02	9.97E-02	2.66E-01	4.35E-01	5.09E-01	5.72E-01	6.48E-01	7.32E-01	8.18E-01	8.98E-01	9.64E-01
9	0.03219	1.60E-01	3.05E-02	1.06E-01	3.04E-01	4.81E-01	5.45E-01	6.04E-01	6.78E-01	7.60E-01	8.45E-01	9.23E-01	9.88E-01
8	0.03031	5.34E-03	1.65E-02	1.19E-01	3.42E-01	5.20E-01	5.77E-01	6.33E-01	7.05E-01	7.85E-01	8.67E-01	9.44E-01	1.01E 00
7	0.02687	5.36E-03	2.18E-02	1.48E-01	4.28E-01	5.87E-01	6.36E-01	6.88E-01	7.55E-01	8.30E-01	9.09E-01	9.83E-01	1.05E 00
6	0.02187	5.47E-03	3.46E-02	2.11E-01	5.51E-01	6.78E-01	7.20E-01	7.68E-01	8.28E-01	8.97E-01	9.69E-01	1.04E 00	1.10E 00
5	0.01625	5.85E-03	6.42E-02	4.22E-01	6.83E-01	7.74E-01	8.12E-01	8.55E-01	9.08E-01	9.70E-01	1.04E 00	1.10E 00	1.16E 00
4	0.01062	7.27E-03	1.25E-01	5.49E-01	7.93E-01	8.59E-01	8.94E-01	9.34E-01	9.82E-01	1.04E 00	1.10E 00	1.16E 00	1.21E 00
3	0.00562	1.31E-02	3.10E-01	6.80E-01	8.67E-01	9.19E-01	9.53E-01	9.92E-01	1.04E 00	1.09E 00	1.14E 00	1.20E 00	1.25E 00
2	0.00156	2.12E-02	4.46E-01	7.95E-01	9.17E-01	9.60E-01	9.95E-01	1.04E 00	1.08E 00	1.14E 00			

50	0.1907E	00	0.1228E	00	0.7677E-01	0.3509E-01	0.4048E-01	0.6857E	09	0.5778E	01-0.8495E-03	0.1532E	02	0.1746E	04	0.1959E	04
51	0.1879E	00	0.1205E	00	0.7657E-01	0.3586E-01	0.4029E-01	0.6618E	09	0.5777E	01-0.9437E-03	0.1532E	02	0.1746E	04	0.1961E	04
52	0.1853E	00	0.1188E	00	0.7629E-01	0.3672E-01	0.4002E-01	0.6316E	09	0.5776E	01-0.1045E-02	0.1533E	02	0.1746E	04	0.1963E	04
53	0.1828E	00	0.1173E	00	0.7597E-01	0.3754E-01	0.3970E-01	0.5968E	09	0.5775E	01-0.1154E-02	0.1533E	02	0.1746E	04	0.1965E	04
54	0.1803E	00	0.1164E	00	0.7568E-01	0.3842E-01	0.3932E-01	0.5579E	09	0.5774E	01-0.1270E-02	0.1534E	02	0.1746E	04	0.1967E	04
55	0.1778E	00	0.1155E	00	0.7535E-01	0.3929E-01	0.3887E-01	0.5164E	09	0.5772E	01-0.1395E-02	0.1535E	02	0.1746E	04	0.1969E	04
56	0.1758E	00	0.1148E	00	0.7516E-01	0.4020E-01	0.3839E-01	0.4734E	09	0.5770E	01-0.1527E-02	0.1535E	02	0.1746E	04	0.1972E	04
57	0.1742E	00	0.1142E	00	0.7489E-01	0.4106E-01	0.3786E-01	0.4348E	09	0.5769E	01-0.1665E-02	0.1536E	02	0.1746E	04	0.1974E	04
58	0.1728E	00	0.1136E	00	0.7454E-01	0.4188E-01	0.3734E-01	0.4157E	09	0.5767E	01-0.1811E-02	0.1537E	02	0.1745E	04	0.1977E	04
59	0.1711E	00	0.1132E	00	0.7408E-01	0.4269E-01	0.3680E-01	0.3970E	09	0.5764E	01-0.1965E-02	0.1537E	02	0.1745E	04	0.1980E	04
60	0.1695E	00	0.1128E	00	0.7356E-01	0.4356E-01	0.3623E-01	0.3784E	09	0.5762E	01-0.2125E-02	0.1538E	02	0.1745E	04	0.1983E	04
61	0.1677E	00	0.1126E	00	0.7309E-01	0.4440E-01	0.3563E-01	0.3623E	09	0.5759E	01-0.2290E-02	0.1539E	02	0.1745E	04	0.1986E	04
62	0.1662E	00	0.1129E	00	0.7265E-01	0.4522E-01	0.3499E-01	0.3448E	09	0.5756E	01-0.2463E-02	0.1540E	02	0.1745E	04	0.1990E	04
63	0.1650E	00	0.1127E	00	0.7236E-01	0.4602E-01	0.3433E-01	0.3261E	09	0.5753E	01-0.2642E-02	0.1540E	02	0.1746E	04	0.1994E	04
64	0.1640E	00	0.1123E	00	0.7197E-01	0.4682E-01	0.3363E-01	0.3060E	09	0.5750E	01-0.2825E-02	0.1541E	02	0.1746E	04	0.1997E	04
65	0.1625E	00	0.1121E	00	0.7148E-01	0.4752E-01	0.3292E-01	0.2859E	09	0.5746E	01-0.3014E-02	0.1542E	02	0.1746E	04	0.2001E	04
66	0.1612E	00	0.1118E	00	0.7089E-01	0.4825E-01	0.3219E-01	0.2688E	09	0.5742E	01-0.3208E-02	0.1543E	02	0.1746E	04	0.2006E	04
67	0.1596E	00	0.1115E	00	0.7021E-01	0.4889E-01	0.3145E-01	0.2559E	09	0.5738E	01-0.3405E-02	0.1544E	02	0.1746E	04	0.2010E	04
68	0.1579E	00	0.1111E	00	0.6947E-01	0.4949E-01	0.3070E-01	0.2455E	09	0.5733E	01-0.3605E-02	0.1545E	02	0.1746E	04	0.2015E	04
69	0.1564E	00	0.1110E	00	0.6867E-01	0.5008E-01	0.2994E-01	0.2421E	09	0.5728E	01-0.3808E-02	0.1545E	02	0.1746E	04	0.2020E	04
70	0.1552E	00	0.1112E	00	0.6803E-01	0.5055E-01	0.2919E-01	0.2407E	09	0.5723E	01-0.4014E-02	0.1546E	02	0.1747E	04	0.2025E	04
71	0.1541E	00	0.1115E	00	0.6745E-01	0.5104E-01	0.2841E-01	0.2377E	09	0.5718E	01-0.4219E-02	0.1547E	02	0.1747E	04	0.2030E	04
72	0.1527E	00	0.1115E	00	0.6678E-01	0.5142E-01	0.2762E-01	0.2355E	09	0.5712E	01-0.4426E-02	0.1548E	02	0.1747E	04	0.2036E	04
73	0.1513E	00	0.1113E	00	0.6606E-01	0.5177E-01	0.2682E-01	0.2328E	09	0.5706E	01-0.4631E-02	0.1549E	02	0.1748E	04	0.2042E	04
74	0.1497E	00	0.1110E	00	0.6524E-01	0.5198E-01	0.2603E-01	0.2281E	09	0.5700E	01-0.4835E-02	0.1550E	02	0.1748E	04	0.2048E	04
75	0.1481E	00	0.1105E	00	0.6437E-01	0.5218E-01	0.2524E-01	0.2230E	09	0.5693E	01-0.5037E-02	0.1552E	02	0.1748E	04	0.2054E	04
76	0.1468E	00	0.1098E	00	0.6341E-01	0.5230E-01	0.2446E-01	0.2159E	09	0.5686E	01-0.5236E-02	0.1553E	02	0.1749E	04	0.2061E	04
77	0.1457E	00	0.1090E	00	0.6240E-01	0.5234E-01	0.2368E-01	0.2086E	09	0.5679E	01-0.5431E-02	0.1554E	02	0.1749E	04	0.2068E	04
78	0.1444E	00	0.1081E	00	0.6137E-01	0.5228E-01	0.2290E-01	0.2004E	09	0.5671E	01-0.5620E-02	0.1555E	02	0.1750E	04	0.2075E	04
79	0.1431E	00	0.1077E	00	0.6044E-01	0.5215E-01	0.2213E-01	0.1932E	09	0.5663E	01-0.5803E-02	0.1556E	02	0.1750E	04	0.2082E	04
80	0.1418E	00	0.1073E	00	0.5956E-01	0.5202E-01	0.2137E-01	0.1852E	09	0.5655E	01-0.5978E-02	0.1558E	02	0.1751E	04	0.2089E	04
81	0.1402E	00	0.1066E	00	0.5860E-01	0.5174E-01	0.2063E-01	0.1772E	09	0.5647E	01-0.6145E-02	0.1559E	02	0.1752E	04	0.2097E	04
82	0.1383E	00	0.1057E	00	0.5759E-01	0.5148E-01	0.1989E-01	0.1680E	09	0.5638E	01-0.6303E-02	0.1560E	02	0.1752E	04	0.2104E	04
83	0.1367E	00	0.1046E	00	0.5651E-01	0.5108E-01	0.1918E-01	0.1588E	09	0.5629E	01-0.6451E-02	0.1561E	02	0.1753E	04	0.2112E	04
84	0.1354E	00	0.1033E	00	0.5541E-01	0.5062E-01	0.1849E-01	0.1508E	09	0.5619E	01-0.6588E-02	0.1563E	02	0.1754E	04	0.2120E	04
85	0.1341E	00	0.1019E	00	0.5430E-01	0.5010E-01	0.1786E-01	0.1434E	09	0.5610E	01-0.6713E-02	0.1564E	02	0.1754E	04	0.2129E	04
86	0.1327E	00	0.1003E	00	0.5316E-01	0.4954E-01	0.1726E-01	0.1360E	09	0.5600E	01-0.6825E-02	0.1566E	02	0.1755E	04	0.2137E	04
87	0.1311E	00	0.9866E-01	0.5200E-01	0.4889E-01	0.1667E-01	0.1286E	09	0.5590E	01-0.6923E-02	0.1567E	02	0.1756E	04	0.2145E	04	
88	0.1297E	00	0.9696E-01	0.5083E-01	0.4823E-01	0.1611E-01	0.1212E	09	0.5579E	01-0.7007E-02	0.1569E	02	0.1757E	04	0.2154E	04	
89	0.1280E	00	0.9553E-01	0.4971E-01	0.4749E-01	0.1565E-01	0.1140E	09	0.5569E	01-0.7076E-02	0.1570E	02	0.1757E	04	0.2163E	04	
90	0.1263E	00	0.9429E-01	0.4860E-01	0.4669E-01	0.1520E-01	0.1085E	09	0.5558E	01-0.7130E-02	0.1572E	02	0.1758E	04	0.2172E	04	
91	0.1246E	00	0.9291E-01	0.4745E-01	0.4587E-01	0.1477E-01	0.1043E	09	0.5547E	01-0.7167E-02	0.1573E	02	0.1759E	04	0.2180E	04	
92	0.1233E	00	0.9138E-01	0.4630E-01	0.4502E-01	0.1435E-01	0.1005E	09	0.5536E	01-0.7188E-02	0.1575E	02	0.1760E	04	0.2189E	04	
93	0.1219E	00	0.8969E-01	0.4518E-01	0.4410E-01	0.1394E-01	0.9740E	08	0.5525E	01-0.7193E-02	0.1577E	02	0.1761E	04	0.2198E	04	
94	0.1204E	00	0.8788E-01	0.4404E-01	0.4316E-01	0.1357E-01	0.9629E	08	0.5514E	01-0.7179E-02	0.1578E	02	0.1762E	04	0.2208E	04	
95	0.1187E	00	0.8592E-01	0.4287E-01	0.4220E-01	0.1328E-01	0.9571E	08	0.5503E	01-0.7149E-02	0.1580E	02	0.1762E	04	0.2217E	04	
96	0.1172E	00	0.8382E-01	0.4170E-01	0.4116E-01	0.1302E-01	0.9496E	08	0.5492E	01-0.7101E-02	0.1582E	02	0.1763E	04	0.2226E	04	
97	0.1156E	00	0.8165E-01	0.4053E-01	0.4019E-01	0.1277E-01	0.9473E	08	0.5480E	01-0.7036E-02	0.1583E	02	0.1764E	04	0.2235E	04	
98	0.1140E	00	0.7940E-01	0.3937E-01	0.3913E-01	0.1250E-01	0.9410E	08	0.5469E	01-0.6954E-02	0.1585E	02	0.1765E	04	0.2244E	04	
99	0.1123E	00	0.7709E-01	0.3824E-01	0.3809E-01	0.1222E-01	0.9409E	08	0.5458E	01-0.6855E-02	0.1587E	02	0.1766E	04	0.2253E	04	
100	0.1108E	00	0.7499E-01	0.3717E-01	0.3700E-01	0.1193E-01	0.9381E	08	0.5447E	01-0.6739E-02	0.1589E	02	0.1767E	04	0.2262E	04	
101	0.1093E	00	0.7311E-01	0.3616E-01	0.3593E-01	0.1168E-01	0.9357E	08	0.5436E	01-0.6607E-02	0.1590E	02	0.1768E	04	0.2270E	04	
102	0.1078E	00	0.7125E-01	0.3515E-01	0.3486E-01	0.1148E-01	0.9416E	08	0.5424E	01-0.6459E-02	0.1592E	02	0.1769E	04	0.2279E	04	
103	0.1061E	00	0.6929E-01	0.3413E-01	0.3377E-01	0.1132E-01	0.9468E	08	0.5414E	01-0.6297E-02	0.1594E	02	0.1770E	04	0.2288E	04	

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0	1	2	3	4	5	6	7	8	9	10	11	12
X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415

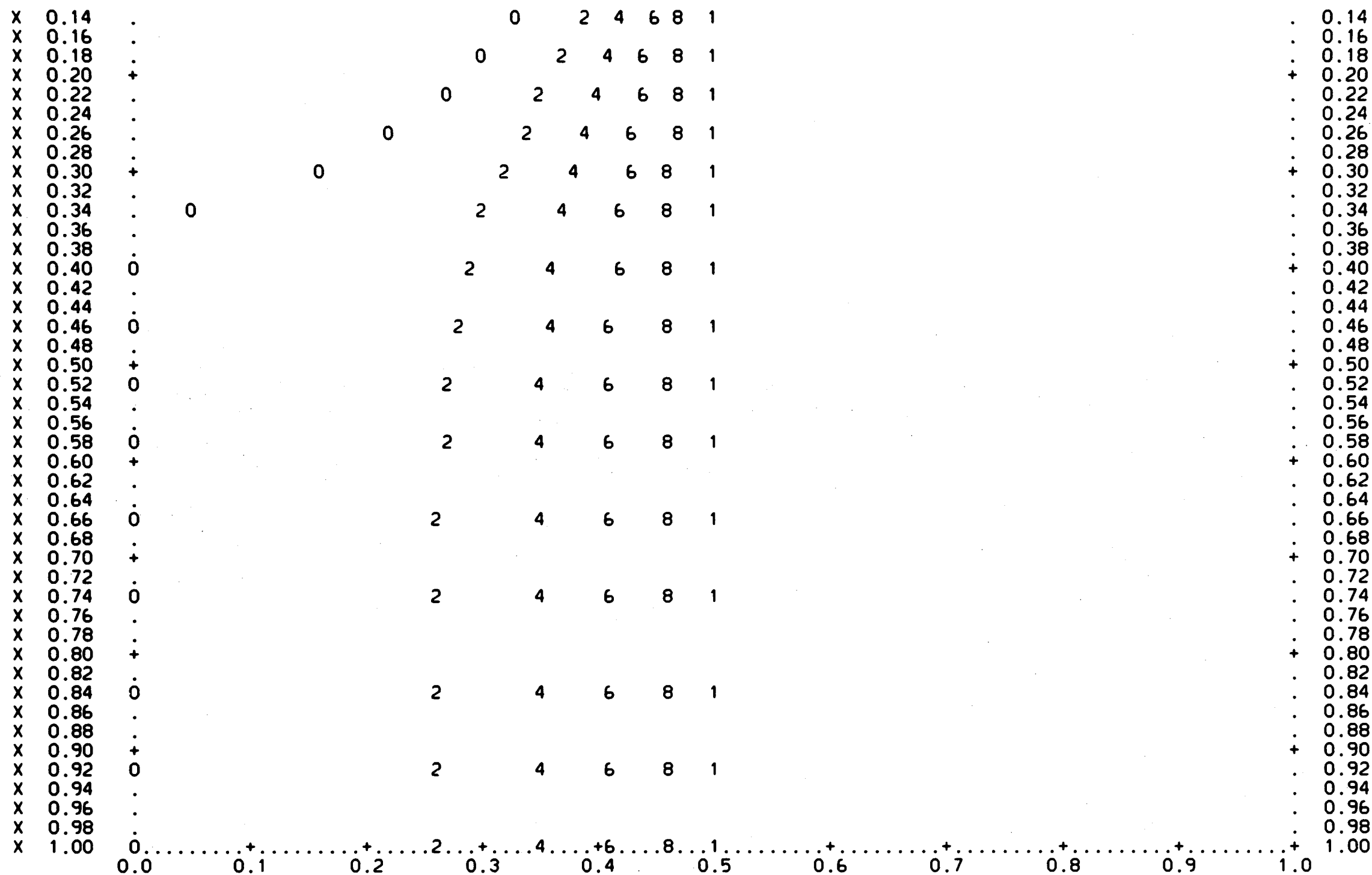
0 J	Y	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	4.46E 05	4.53E 05	4.33E 05	4.26E 05	4.28E 05	4.32E 05	4.35E 05	4.38E 05	4.38E 05	4.38E 05
19	0.47500	0.00	0.00	0.00	0.00	4.37E 05	4.47E 05	4.28E 05	4.22E 05	4.24E 05	4.28E 05	4.31E 05	4.34E 05	4.34E 05	4.34E 05
18	0.44750	0.00	0.00	0.00	0.00	4.20E 05	4.36E 05	4.20E 05	4.15E 05	4.18E 05	4.22E 05	4.25E 05	4.26E 05	4.26E 05	4.26E 05
17	0.42750	0.00	0.00	0.00	4.39E 05	4.17E 05	4.25E 05	4.12E 05	4.09E 05	4.13E 05	4.17E 05	4.19E 05	4.20E 05	4.20E 05	4.20E 05
16	0.40625	0.00	0.00	0.00	4.17E 05	4.15E 05	4.12E 05	4.03E 05	4.03E 05	4.07E 05	4.11E 05	4.12E 05	4.13E 05	4.13E 05	4.13E 05
15	0.38500	0.00	0.00	0.00	3.90E 05	4.06E 05	3.99E 05	3.93E 05	3.95E 05	4.00E 05	4.04E 05	4.05E 05	4.05E 05	4.05E 05	4.05E 05
14	0.36500	0.00	0.00	4.21E 05	3.82E 05	3.92E 05	3.87E 05	3.83E 05	3.88E 05	3.93E 05	3.96E 05	3.97E 05	3.97E 05	3.97E 05	3.97E 05
13	0.34625	0.00	0.00	3.93E 05	3.82E 05	3.80E 05	3.74E 05	3.74E 05	3.80E 05	3.85E 05	3.88E 05	3.89E 05	3.89E 05	3.89E 05	3.89E 05
12	0.32750	0.00	0.00	3.52E 05	3.71E 05	3.67E 05	3.63E 05	3.65E 05	3.72E 05	3.77E 05	3.79E 05	3.80E 05	3.81E 05	3.81E 05	3.81E 05
11	0.29750	0.00	2.90E 05	3.13E 05	3.45E 05	3.45E 05	3.43E 05	3.49E 05	3.56E 05	3.61E 05	3.64E 05	3.65E 05	3.66E 05	3.66E 05	3.66E 05
10	0.27500	0.00	2.31E 05	2.98E 05	3.26E 05	3.28E 05	3.28E 05	3.36E 05	3.43E 05	3.48E 05	3.51E 05	3.54E 05	3.56E 05	3.56E 05	3.56E 05
9	0.25750	0.00	1.63E 05	2.83E 05	3.11E 05	3.14E 05	3.17E 05	3.26E 05	3.33E 05	3.37E 05	3.41E 05	3.44E 05	3.47E 05	3.47E 05	3.47E 05
8	0.24250	0.00	1.41E 05	2.65E 05	2.99E 05	3.04E 05	3.08E 05	3.16E 05	3.23E 05	3.28E 05	3.32E 05	3.36E 05	3.40E 05	3.40E 05	3.40E 05
7	0.21500	0.00	1.64E 05	2.44E 05	2.79E 05	2.86E 05	2.91E 05	2.98E 05	3.05E 05	3.10E 05	3.16E 05	3.21E 05	3.26E 05	3.26E 05	3.26E 05
6	0.17500	0.00	1.69E 05	2.21E 05	2.51E 05	2.58E 05	2.65E 05	2.71E 05	2.78E 05	2.85E 05	2.93E 05	3.01E 05	3.08E 05	3.08E 05	3.08E 05
5	0.13000	0.00	1.52E 05	1.95E 05	2.18E 05	2.30E 05	2.36E 05	2.43E 05	2.51E 05	2.60E 05	2.70E 05	2.80E 05	2.90E 05	2.90E 05	2.90E 05
4	0.08500	0.00	1.11E 05	1.69E 05	1.94E 05	2.03E 05	2.11E 05	2.20E 05	2.29E 05	2.40E 05	2.52E 05	2.65E 05	2.77E 05	2.77E 05	2.77E 05
3	0.04500	0.00	4.40E 04	1.46E 05	1.65E 05	1.84E 05	1.96E 05	2.06E 05	2.17E 05	2.29E 05	2.42E 05	2.56E 05	2.69E 05	2.69E 05	2.69E 05
2	0.01250	0.00	0.00	1.36E 05	1.58E 05	1.77E 05	1.90E 05	2.01E 05	2.12E 05	2.25E 05	2.38E 05	2.52E 05	2.66E 05	2.66E 05	

0	J	Y													
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	4.40E 05	4.42E 05	4.43E 05	4.43E 05	4.42E 05	4.41E 05	4.39E 05	4.37E 05	4.35E 05	4.33E 05	0.00	0.00	0.00	0.00
19	0.47500	4.35E 05	4.36E 05	4.36E 05	4.36E 05	4.35E 05	4.34E 05	4.32E 05	4.30E 05	4.28E 05	4.26E 05	0.00	0.00	0.00	0.00
18	0.44750	4.27E 05	4.27E 05	4.26E 05	4.25E 05	4.24E 05	4.23E 05	4.21E 05	4.20E 05	4.18E 05	4.16E 05	0.00	0.00	0.00	0.00
17	0.42750	4.20E 05	4.19E 05	4.18E 05	4.17E 05	4.16E 05	4.15E 05	4.13E 05	4.12E 05	4.11E 05	4.09E 05	0.00	0.00	0.00	0.00
16	0.40625	4.12E 05	4.11E 05	4.10E 05	4.09E 05	4.08E 05	4.06E 05	4.05E 05	4.04E 05	4.03E 05	4.02E 05	0.00	0.00	0.00	0.00
15	0.38500	4.04E 05	4.03E 05	4.02E 05	4.01E 05	3.99E 05	3.98E 05	3.97E 05	3.96E 05	3.95E 05	3.94E 05	0.00	0.00	0.00	0.00
14	0.36500	3.96E 05	3.95E 05	3.94E 05	3.93E 05	3.92E 05	3.91E 05	3.90E 05	3.89E 05	3.88E 05	3.88E 05	0.00	0.00	0.00	0.00
13	0.34625	3.88E 05	3.88E 05	3.87E 05	3.86E 05	3.85E 05	3.84E 05	3.83E 05	3.83E 05	3.82E 05	3.82E 05	0.00	0.00	0.00	0.00
12	0.32750	3.80E 05	3.80E 05	3.79E 05	3.78E 05	3.78E 05	3.77E 05	3.77E 05	3.77E 05	3.76E 05	3.76E 05	0.00	0.00	0.00	0.00
11	0.29750	3.67E 05	3.68E 05	3.67E 05	3.67E 05	3.67E 05	3.67E 05	3.67E 05	3.67E 05	3.67E 05	3.68E 05	0.00	0.00	0.00	0.00
10	0.27500	3.57E 05	3.58E 05	3.59E 05	3.59E 05	3.60E 05	3.60E 05	3.60E 05	3.61E 05	3.61E 05	3.62E 05	0.00	0.00	0.00	0.00

[illegible]

O	J	Y	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.66E 01	1.66E 01	1.66E 01	1.67E 01	1.67E 01	1.67E 01	1.69E 01	1.77E 01	1.91E 01	0.00
19	0.05937	0.00	0.00	0.00	0.00	1.72E 01	1.71E 01	1.71E 01	1.73E 01	1.74E 01	1.74E 01	1.79E 01	1.89E 01	2.02E 01	0.00
18	0.05594	0.00	0.00	0.00	0.00	1.77E 01	1.74E 01	1.74E 01	1.75E 01	1.78E 01	1.78E 01	1.86E 01	1.97E 01	2.08E 01	0.00
17	0.05344	0.00	0.00	0.00	1.99E 01	1.86E 01	1.79E 01	1.77E 01	1.79E 01	1.84E 01	1.84E 01	1.93E 01	2.02E 01	2.11E 01	0.00
16	0.05078	0.00	0.00	0.00	2.06E 01	1.89E 01	1.80E 01	1.80E 01	1.84E 01	1.92E 01	1.92E 01	2.01E 01	2.08E 01	2.13E 01	0.00
15	0.04812	0.00	0.00	0.00	2.14E 01	1.91E 01	1.81E 01	1.82E 01	1.90E 01	2.01E 01	2.01E 01	2.08E 01	2.12E 01	2.14E 01	0.00
14	0.04562	0.00	0.00	2.59E 01	2.25E 01	1.92E 01	1.81E 01	1.86E 01	1.98E 01	2.08E 01	2.08E 01	2.14E 01	2.15E 01	2.15E 01	0.00
13	0.04328	0.00	0.00	2.68E 01	2.25E 01	1.89E 01	1.80E 01	1.90E 01	2.05E 01	2.14E 01	2.14E 01	2.17E 01	2.16E 01	2.14E 01	0.00
12	0.04094	0.00	0.00	2.80E 01	2.25E 01	1.87E 01	1.81E 01	1.96E 01	2.11E 01	2.18E 01	2.18E 01	2.19E 01	2.16E 01	2.12E 01	0.00
11	0.03719	0.00	3.63E 01	2.99E 01	2.25E 01	1.83E 01	1.84E 01	2.05E 01	2.18E 01	2.21E 01	2.21E 01	2.19E 01	2.13E 01	2.06E 01	0.00
10	0.03437	0.00	3.82E 01	3.03E 01	2.19E 01	1.79E 01	1.89E 01	2.09E 01	2.19E 01	2.19E 01	2.19E 01	2.15E 01	2.07E 01	1.99E 01	0.00
9	0.03219	0.00	4.05E 01	3.06E 01	2.13E 01	1.76E 01	1.92E 01	2.09E 01	2.17E 01	2.16E 01	2.16E 01	2.10E 01	2.02E 01	1.93E 01	0.00
8	0.03031	5.20E 01	4.30E 01	3.04E 01	2.06E 01	1.75E 01	1.93E 01	2.08E 01	2.13E 01	2.11E 01	2.11E 01	2.05E 01	1.96E 01	1.87E 01	0.00
7	0.02687	5.20E 01	4.23E 01	2.91E 01	1.95E 01	1.74E 01	1.91E 01	2.00E 01	2.02E 01	1.98E 01	1.98E 01	1.91E 01	1.82E 01	1.73E 01	0.00
6	0.02187	5.20E 01	4.06E 01	2.66E 01	1.76E 01	1.68E 01	1.75E 01	1.77E 01	1.77E 01	1.73E 01	1.73E 01	1.66E 01	1.58E 01	1.49E 01	0.00
5	0.01625	5.20E 01	3.75E 01	2.25E 01	1.46E 01	1.44E 01	1.43E 01	1.41E 01	1.39E 01	1.35E 01	1.35E 01	1.30E 01	1.23E 01	1.16E 01	0.00
4	0.01062	5.20E 01	3.31E 01	1.67E 01	1.05E 01	1.02E 01	9.93E 00	9.64E 00	9.43E 00	9.18E 00	9.18E 00	8.82E 00	8.37E 00	7.85E 00	0.00
3	0.00562	5.20E 01	2.65E 01	4.59E 00	6.18E 00	5.69E 00	5.46E 00	5.26E 00	5.12E 00	4.99E 00	4.99E 00	4.80E 00	4.55E 00	4.27E 00	0.00
2	0.00156	5.20E 01	7.37E 00	1.27E 00	1.72E 00	1.58E 00	1.52E 00	1.46E 00	1.42E 00	1.39E 00	1.39E 00	1.33E 00	1.26E 00	1.19E 00	0.00
1	-0.00156	0.00	0.00	0.											

[illegible][illegible]



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE

SYMBOL

MAXIMUM VALUES 0.360E 02 0.395E 02 0.424E 02 0.450E 02 0.474E 02 0.500E 02

COMPUTED INLET SWIRL NUMBER = 1.4320

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

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0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
0      I =      1      2      3      4      5      6      7      8      9      10     11     12
      X = 0.00000 0.00000 0.00787 0.01617 0.02539 0.03561 0.04697 0.05957 0.07356 0.08909 0.10632 0.12545
0 J      Y
21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
20 0.06187      0.00      0.00      0.00      0.00      0.00      8.11E 00 1.42E 01 1.51E 01 1.42E 01 1.32E 01 1.23E 01 1.15E 01
19 0.05937      0.00      0.00      0.00      0.00      0.00      1.20E 01 1.64E 01 1.68E 01 1.57E 01 1.44E 01 1.31E 01 1.20E 01
18 0.05594      0.00      0.00      0.00      0.00      0.00      1.62E 01 1.88E 01 1.82E 01 1.66E 01 1.48E 01 1.32E 01 1.20E 01
17 0.05344      0.00      0.00      0.00      0.00      2.22E 01 1.95E 01 1.98E 01 1.83E 01 1.63E 01 1.43E 01 1.29E 01 1.18E 01
16 0.05078      0.00      0.00      0.00      0.00      1.94E 01 1.90E 01 1.85E 01 1.69E 01 1.49E 01 1.33E 01 1.21E 01 1.13E 01
15 0.04812      0.00      0.00      0.00      0.00      1.94E 01 1.84E 01 1.64E 01 1.43E 01 1.28E 01 1.19E 01 1.12E 01 1.06E 01
14 0.04562      0.00      0.00      0.00      2.85E 01 2.11E 01 1.70E 01 1.34E 01 1.14E 01 1.07E 01 1.04E 01 1.02E 01 9.86E 00
13 0.04328      0.00      0.00      0.00      2.16E 01 1.84E 01 1.35E 01 9.77E 00 8.55E 00 8.68E 00 9.01E 00 9.14E 00 9.07E 00
12 0.04094      0.00      0.00      0.00      1.91E 01 1.64E 01 1.03E 01 6.30E 00 5.91E 00 6.80E 00 7.61E 00 8.05E 00 8.21E 00
11 0.03719      0.00      0.00      2.47E 01 1.93E 01 1.38E 01 4.73E 00 1.36E 00 2.40E 00 4.10E 00 5.41E 00 6.23E 00 6.71E 00
10 0.03437      0.00      0.00      1.90E 01 1.71E 01 9.85E 00 4.71E -01 -1.26E 00 3.05E -01 2.27E 00 3.80E 00 4.83E 00 5.52E 00
9 0.03219      0.00      0.00      1.94E 01 1.61E 01 6.58E 00 -2.09E 00 -2.82E 00 -1.09E 00 9.47E -01 2.57E 00 3.74E 00 4.59E 00
8 0.03031      0.00      3.00E 01 2.18E 01 1.50E 01 3.68E 00 -3.71E 00 -3.89E 00 -2.15E 00 -1.21E -01 1.55E 00 2.81E 00 3.78E 00
7 0.02687      0.00      3.00E 01 2.26E 01 1.30E 01 -6.16E -01 -5.77E 00 -5.39E 00 -3.81E 00 -1.92E 00 -2.40E -01 1.15E 00 2.32E 00
6 0.02187      0.00      3.00E 01 2.19E 01 8.29E 00 -7.37E 00 -7.68E 00 -7.00E 00 -5.78E 00 -4.22E 00 -2.62E 00 -1.11E 00 2.87E -01
5 0.01625      0.00      3.00E 01 1.85E 01 -2.39E 00 -9.64E 00 -9.23E 00 -8.45E 00 -7.52E 00 -6.32E 00 -4.88E 00 -3.30E 00 -1.70E 00
4 0.01062      0.00      3.00E 01 1.00E 01 -1.46E 01 -1.20E 01 -1.06E 01 -9.59E 00 -8.79E 00 -7.84E 00 -6.55E 00 -4.96E 00 -3.22E 00
3 0.00562      0.00      3.00E 01 -8.09E 00 -1.49E 01 -1.30E 01 -1.14E 01 -1.03E 01 -9.49E 00 -8.65E 00 -7.46E 00 -5.89E 00 -4.07E 00
2 0.00156      0.00      3.00E 01 -2.05E 01 -1.57E 01 -1.34E 01 -1.17E 01 -1.05E 01 -9.74E 00 -8.94E 00 -7.78E 00 -6.22E 00 -4.38E 00
1 -0.00156      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0      I =      13      14      15      16      17      18      19      20      21      22      23
      X = 0.14669 0.17026 0.19643 0.22547 0.25771 0.29349 0.33321 0.37500 0.41679 0.45858 0.50037
0 J      Y
21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
20 0.06187      1.07E 01 1.02E 01 9.81E 00 9.63E 00 9.55E 00 9.53E 00 9.51E 00 9.52E 00 9.53E 00 9.57E 00 9.57E 00
19 0.05937      1.12E 01 1.05E 01 1.01E 01 9.92E 00 9.83E 00 9.81E 00 9.83E 00 9.88E 00 9.95E 00 1.00E 01 1.00E 01
18 0.05594      1.11E 01 1.05E 01 1.01E 01 9.81E 00 9.66E 00 9.58E 00 9.55E 00 9.56E 00 9.59E 00 9.62E 00 9.62E 00
17 0.05344      1.09E 01 1.03E 01 9.91E 00 9.63E 00 9.44E 00 9.33E 00 9.27E 00 9.24E 00 9.24E 00 9.25E 00 9.25E 00
16 0.05078      1.06E 01 1.00E 01 9.64E 00 9.35E 00 9.15E 00 9.02E 00 8.93E 00 8.87E 00 8.85E 00 8.84E 00 8.84E 00
15 0.04812      1.01E 01 9.64E 00 9.28E 00 9.01E 00 8.81E 00 8.66E 00 8.56E 00 8.49E 00 8.45E 00 8.43E 00 8.43E 00
14 0.04562      9.51E 00 9.17E 00 8.88E 00 8.64E 00 8.45E 00 8.30E 00 8.20E 00 8.12E 00 8.07E 00 8.04E 00 8.04E 00
13 0.04328      8.89E 00 8.67E 00 8.45E 00 8.24E 00 8.08E 00 7.95E 00 7.84E 00 7.77E 00 7.72E 00 7.68E 00 7.68E 00
12 0.04094      8.20E 00 8.11E 00 7.97E 00 7.82E 00 7.68E 00 7.57E 00 7.48E 00 7.41E 00 7.36E 00 7.32E 00 7.32E 00
11 0.03719      6.98E 00 7.09E 00 7.11E 00 7.07E 00 7.01E 00 6.95E 00 6.89E 00 6.84E 00 6.79E 00 6.76E 00 6.76E 00
10 0.03437      5.99E 00 6.28E 00 6.43E 00 6.48E 00 6.49E 00 6.47E 00 6.44E 00 6.41E 00 6.38E 00 6.35E 00 6.34E 00
9 0.03219      5.21E 00 5.63E 00 5.88E 00 6.02E 00 6.08E 00 6.10E 00 6.10E 00 6.09E 00 6.07E 00 6.04E 00 6.04E 00
8 0.03031      4.53E 00 5.06E 00 5.41E 00 5.62E 00 5.73E 00 5.79E 00 5.82E 00 5.82E 00 5.81E 00 5.78E 00 5.78E 00
7 0.02687      3.28E 00 4.03E 00 4.54E 00 4.89E 00 5.10E 00 5.23E 00 5.31E 00 5.35E 00 5.35E 00 5.34E 00 5.33E 00
6 0.02187      1.54E 00 2.56E 00 3.33E 00 3.87E 00 4.23E 00 4.47E 00 4.63E 00 4.72E 00 4.75E 00 4.75E 00 4.75E 00
5 0.01625      -1.93E -01 1.10E 00 2.12E 00 2.86E 00 3.38E 00 3.74E 00 3.98E 00 4.12E 00 4.18E 00 4.19E 00 4.19E 00
```


	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	9.73E-01	9.75E-01	9.75E-01	9.76E-01	9.76E-01	9.76E-01	9.76E-01	9.76E-01	9.75E-01	9.75E-01	9.75E-01
19	0.05937	8.60E-01	8.68E-01	8.72E-01	8.75E-01	8.75E-01	8.76E-01	8.76E-01	8.75E-01	8.75E-01	8.74E-01	8.74E-01
18	0.05594	7.09E-01	7.25E-01	7.35E-01	7.41E-01	7.44E-01	7.44E-01	7.44E-01	7.44E-01	7.43E-01	7.41E-01	7.41E-01
17	0.05344	6.06E-01	6.28E-01	6.42E-01	6.50E-01	6.54E-01	6.56E-01	6.57E-01	6.56E-01	6.55E-01	6.53E-01	6.53E-01
16	0.05078	5.05E-01	5.32E-01	5.50E-01	5.61E-01	5.66E-01	5.69E-01	5.71E-01	5.70E-01	5.69E-01	5.68E-01	5.68E-01
15	0.04812	4.12E-01	4.44E-01	4.65E-01	4.78E-01	4.86E-01	4.90E-01	4.92E-01	4.92E-01	4.92E-01	4.90E-01	4.90E-01
14	0.04562	3.33E-01	3.68E-01	3.92E-01	4.08E-01	4.17E-01	4.22E-01	4.25E-01	4.26E-01	4.25E-01	4.24E-01	4.24E-01
13	0.04328	2.68E-01	3.05E-01	3.31E-01	3.47E-01	3.58E-01	3.64E-01	3.68E-01	3.69E-01	3.69E-01	3.68E-01	3.68E-01
12	0.04094	2.10E-01	2.48E-01	2.75E-01	2.93E-01	3.05E-01	3.12E-01	3.16E-01	3.18E-01	3.18E-01	3.18E-01	3.18E-01
11	0.03719	1.34E-01	1.72E-01	2.00E-01	2.19E-01	2.31E-01	2.39E-01	2.44E-01	2.47E-01	2.48E-01	2.47E-01	2.47E-01
10	0.03437	8.93E-02	1.26E-01	1.53E-01	1.72E-01	1.85E-01	1.93E-01	1.99E-01	2.01E-01	2.02E-01	2.02E-01	2.02E-01
9	0.03219	6.14E-02	9.63E-02	1.22E-01	1.41E-01	1.54E-01	1.62E-01	1.67E-01	1.70E-01	1.71E-01	1.71E-01	1.71E-01
8	0.03031	4.19E-02	7.48E-02	9.98E-02	1.18E-01	1.30E-01	1.38E-01	1.43E-01	1.46E-01	1.48E-01	1.48E-01	1.47E-01
7	0.02687	1.55E-02	4.41E-02	6.63E-02	8.23E-02	9.34E-02	1.01E-01	1.06E-01	1.09E-01	1.10E-01	1.10E-01	1.10E-01
6	0.02187	-5.33E-03	1.61E-02	3.30E-02	4.55E-02	5.42E-02	6.03E-02	6.43E-02	6.66E-02	6.78E-02	6.79E-02	6.79E-02
5	0.01625	-1.12E-02	1.93E-03	1.24E-02	2.03E-02	2.59E-02	2.98E-02	3.24E-02	3.40E-02	3.47E-02	3.49E-02	3.49E-02
4	0.01062	-7.48E-03	-1.46E-03	3.42E-03	7.11E-03	9.78E-03	1.16E-02	1.29E-02	1.36E-02	1.40E-02	1.41E-02	1.41E-02
3	0.00562	-2.54E-03	-7.82E-04	6.49E-04	1.74E-03	2.53E-03	3.08E-03	3.45E-03	3.68E-03	3.79E-03	3.82E-03	3.82E-03
2	0.00156	-2.12E-04	-7.43E-05	3.85E-05	1.25E-04	1.87E-04	2.31E-04	2.61E-04	2.78E-04	2.88E-04	2.90E-04	2.90E-04
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*	----	RADIAL COORDINATE OF STREAMLINES												----
0	I =	1	2	3	4	5	6	7	8	9	10	11	12	
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545	
0 J	Y													
11	1.00000	0.00	3.12E-02	3.91E-02	4.69E-02	5.47E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	
10	0.90000	0.00	2.96E-02	3.91E-02	4.69E-02	5.34E-02	5.99E-02	6.09E-02	6.09E-02	6.08E-02	6.07E-02	6.05E-02	6.04E-02	
9	0.80000	0.00	2.79E-02	3.55E-02	4.44E-02	5.21E-02	5.80E-02	5.93E-02	5.94E-02	5.92E-02	5.89E-02	5.86E-02	5.83E-02	
8	0.70000	0.00	2.61E-02	3.35E-02	4.30E-02	5.07E-02	5.62E-02	5.78E-02	5.80E-02	5.76E-02	5.72E-02	5.67E-02	5.62E-02	
7	0.60000	0.00	2.41E-02	3.12E-02	4.13E-02	4.92E-02	5.46E-02	5.64E-02	5.65E-02	5.61E-02	5.54E-02	5.47E-02	5.40E-02	
6	0.50000	0.00	2.21E-02	2.89E-02	3.94E-02	4.76E-02	5.31E-02	5.50E-02	5.50E-02	5.44E-02	5.36E-02	5.26E-02	5.16E-02	
5	0.40000	0.00	1.96E-02	2.66E-02	3.74E-02	4.61E-02	5.17E-02	5.36E-02	5.36E-02	5.27E-02	5.16E-02	5.03E-02	4.90E-02	
4	0.30000	0.00	1.70E-02	2.39E-02	3.52E-02	4.45E-02	5.02E-02	5.21E-02	5.20E-02	5.09E-02	4.93E-02	4.77E-02	4.60E-02	
3	0.20000	0.00	1.37E-02	2.09E-02	3.27E-02	4.27E-02	4.86E-02	5.06E-02	5.03E-02	4.88E-02	4.68E-02	4.46E-02	4.25E-02	
2	0.10000	0.00	9.69E-03	1.71E-02	2.97E-02	4.06E-02	4.69E-02	4.89E-02	4.84E-02	4.64E-02	4.36E-02	4.08E-02	3.79E-02	
1	0.00000	0.00	0.00	1.08E-02	2.56E-02	3.82E-02	4.50E-02	4.70E-02	4.61E-02	4.31E-02	3.90E-02	3.49E-02	2.99E-02	
0	I =	13	14	15	16	17	18	19	20	21	22	23		
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037		
0 J	Y													
11	1.00000	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02		
10	0.90000	6.03E-02	6.01E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02		
9	0.80000	5.80E-02	5.77E-02	5.76E-02	5.75E-02	5.74E-02	5.74E-02	5.74E-02	5.74E-02	5.74E-02	5.75E-02	5.75E-02		
8	0.70000	5.57E-02	5.53E-02	5.50E-02	5.48E-02	5.47E-02	5.47E-02	5.47E-02	5.47E-02	5.47E-02	5.48E-02	5.48E-02		
7	0.60000	5.33E-02	5.27E-02	5.22E-02	5.19E-02	5.18E-02	5.17E-02	5.17E-02	5.17E-02	5.17E-02	5.18E-02	5.18E-02		
6	0.50000	5.07E-02	4.98E-02	4.92E-02	4.88E-02	4.86E-02	4.85E-02	4.84E-02	4.84E-02	4.84E-02	4.85E-02	4.85E-02		
5	0.40000	4.77E-02	4.67E-02	4.59E-02	4.53E-02	4.50E-02	4.47E-02	4.46E-02	4.46E-02	4.46E-02	4.46E-02	4.46E-02		
4	0.30000	4.44E-02	4.31E-02	4.20E-02	4.12E-02	4.07E-02	4.03E-02	4.01E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02		
3	0.20000	4.04E-02	3.86E-02	3.72E-02	3.61E-02	3.53E-02	3.48E-02	3.45E-02	3.43E-02	3.42E-02	3.42E-02	3.42E-02		
2	0.10000	3.50E-02	3.25E-02	3.03E-02	2.86E-02	2.75E-02	2.68E-02	2.62E-02	2.58E-02	2.57E-02	2.57E-02	2.57E-02		
1	0.00000	2.32E-02	1.30E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0*	----	DIMENSIONLESS U VELOCITY												----
0	I =	1	2	3	4	5	6	7	8	9	10	11	12	

20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	2.12E 01	2.05E 01	1.85E 01	1.70E 01	1.64E 01	1.71E 01	1.88E 01	1.99E 01
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.72E 02	4.12E 02	3.60E 02	3.14E 02	3.08E 02	3.99E 02	5.29E 02	5.87E 02
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	4.68E 02	4.15E 02	3.83E 02	3.77E 02	4.62E 02	7.22E 02	1.01E 03	1.15E 03
17	0.42750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	7.04E 01	2.62E 02	3.17E 02	3.56E 02	4.24E 02	6.21E 02	9.60E 02	1.28E 03	1.45E 03
16	0.40625	1.00E 00	1.00E 00	1.00E 00	1.00E 00	4.53E 02	3.78E 02	3.74E 02	4.16E 02	5.61E 02	8.52E 02	1.21E 03	1.53E 03	1.70E 03
15	0.38500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	4.42E 02	3.46E 02	3.90E 02	5.22E 02	7.75E 02	1.11E 03	1.45E 03	1.74E 03	1.91E 03
14	0.36500	1.00E 00	1.00E 00	8.47E 01	2.07E 02	3.00E 02	4.53E 02	6.97E 02	1.01E 03	1.34E 03	1.65E 03	1.92E 03	2.09E 03	
13	0.34625	1.00E 00	1.00E 00	4.37E 02	2.75E 02	3.62E 02	5.92E 02	9.01E 02	1.22E 03	1.53E 03	1.83E 03	2.08E 03	2.23E 03	
12	0.32750	1.00E 00	1.00E 00	3.60E 02	2.18E 02	4.05E 02	7.49E 02	1.10E 03	1.41E 03	1.71E 03	1.99E 03	2.22E 03	2.36E 03	
11	0.29750	1.00E 00	1.45E 02	1.12E 02	1.74E 02	5.17E 02	1.06E 03	1.40E 03	1.67E 03	1.95E 03	2.21E 03	2.43E 03	2.55E 03	
10	0.27500	1.00E 00	4.47E 02	9.78E 01	2.01E 02	7.46E 02	1.27E 03	1.56E 03	1.83E 03	2.10E 03	2.35E 03	2.56E 03	2.68E 03	
9	0.25750	1.00E 00	3.66E 02	4.25E 01	2.32E 02	8.84E 02	1.40E 03	1.67E 03	1.93E 03	2.20E 03	2.45E 03	2.66E 03	2.76E 03	
8	0.24250	1.00E 00	7.08E 00	2.10E 01	2.83E 02	1.01E 03	1.51E 03	1.75E 03	2.01E 03	2.28E 03	2.53E 03	2.73E 03	2.83E 03	
7	0.21500	1.00E 00	7.12E 00	3.14E 01	4.00E 02	1.26E 03	1.67E 03	1.90E 03	2.14E 03	2.41E 03	2.66E 03	2.85E 03	2.94E 03	
6	0.17500	1.00E 00	7.32E 00	6.20E 01	6.73E 02	1.52E 03	1.89E 03	2.09E 03	2.32E 03	2.58E 03	2.82E 03	2.99E 03	3.06E 03	
5	0.13000	1.00E 00	8.01E 00	1.55E 02	1.36E 03	1.83E 03	2.11E 03	2.29E 03	2.51E 03	2.75E 03	2.97E 03	3.12E 03	3.18E 03	
4	0.08500	1.00E 00	1.08E 01	4.10E 02	1.58E 03	2.10E 03	2.30E 03	2.46E 03	2.67E 03	2.89E 03	3.09E 03	3.22E 03	3.26E 03	
3	0.04500	1.00E 00	2.44E 01	1.01E 03	1.85E 03	2.28E 03	2.44E 03	2.59E 03	2.79E 03	3.01E 03	3.19E 03	3.31E 03	3.34E 03	
2	0.01250	1.00E 00	4.84E 01	1.42E 03	2.13E 03	2.41E 03	2.54E 03	2.70E 03	2.91E 03	3.13E 03	3.31E 03	3.41E 03	3.44E 03	
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 1.26289 1.46130 1.68153 1.92598 2.19733 2.49852 2.83285 3.16718 3.50150 3.83583 4.17015

21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	2.00E 01	1.94E 01	1.86E 01	1.78E 01	1.71E 01	1.64E 01	1.59E 01	1.55E 01	1.51E 01	1.50E 01	1.50E 01	1.00E 00	
19	0.47500	5.67E 02	5.03E 02	4.21E 02	3.39E 02	2.65E 02	2.04E 02	1.60E 02	1.30E 02	1.10E 02	1.28E 02	1.00E 00		
18	0.44750	1.14E 03	1.04E 03	8.99E 02	7.49E 02	6.08E 02	4.87E 02	3.93E 02	3.24E 02	2.74E 02	3.26E 02	1.00E 00		
17	0.42750	1.45E 03	1.35E 03	1.18E 03	1.01E 03	8.37E 02	6.89E 02	5.70E 02	4.82E 02	4.17E 02	4.91E 02	1.00E 00		
16	0.40625	1.72E 03	1.61E 03	1.44E 03	1.24E 03	1.05E 03	8.83E 02	7.47E 02	6.44E 02	5.67E 02	6.59E 02	1.00E 00		
15	0.38500	1.93E 03	1.82E 03	1.65E 03	1.44E 03	1.24E 03	1.05E 03	9.05E 02	7.92E 02	7.06E 02	8.11E 02	1.00E 00		
14	0.36500	2.10E 03	2.00E 03	1.81E 03	1.60E 03	1.39E 03	1.20E 03	1.04E 03	9.16E 02	8.25E 02	9.36E 02	1.00E 00		
13	0.34625	2.24E 03	2.13E 03	1.95E 03	1.73E 03	1.51E 03	1.31E 03	1.15E 03	1.02E 03	9.24E 02	1.04E 03	1.00E 00		
12	0.32750	2.37E 03	2.26E 03	2.07E 03	1.84E 03	1.62E 03	1.41E 03	1.24E 03	1.11E 03	1.01E 03	1.13E 03	1.00E 00		
11	0.29750	2.55E 03	2.43E 03	2.23E 03	2.00E 03	1.76E 03	1.55E 03	1.37E 03	1.24E 03	1.13E 03	1.25E 03	1.00E 00		
10	0.27500	2.66E 03	2.53E 03	2.33E 03	2.09E 03	1.86E 03	1.64E 03	1.46E 03	1.32E 03	1.21E 03	1.32E 03	1.00E 00		
9	0.25750	2.74E 03	2.61E 03	2.40E 03	2.16E 03	1.92E 03	1.70E 03	1.51E 03	1.37E 03	1.26E 03	1.37E 03	1.00E 00		
8	0.24250	2.81E 03	2.67E 03	2.45E 03	2.21E 03	1.97E 03	1.74E 03	1.56E 03	1.41E 03	1.30E 03	1.41E 03	1.00E 00		
7	0.21500	2.91E 03	2.76E 03	2.54E 03	2.29E 03	2.04E 03	1.81E 03	1.62E 03	1.47E 03	1.36E 03	1.46E 03	1.00E 00		
6	0.17500	3.02E 03	2.88E 03	2.64E 03	2.38E 03	2.12E 03	1.89E 03	1.70E 03	1.54E 03	1.42E 03	1.52E 03	1.00E 00		
5	0.13000	3.12E 03	2.97E 03	2.73E 03	2.46E 03	2.20E 03	1.96E 03	1.76E 03	1.60E 03	1.48E 03	1.56E 03	1.00E 00		
4	0.08500	3.20E 03	3.04E 03	2.80E 03	2.53E 03	2.25E 03	2.01E 03	1.80E 03	1.64E 03	1.52E 03	1.60E 03	1.00E 00		
3	0.04500	3.27E 03	3.09E 03	2.85E 03	2.57E 03	2.29E 03	2.04E 03	1.83E 03	1.67E 03	1.54E 03	1.62E 03	1.00E 00		
2	0.01250	3.35E 03	3.16E 03	2.90E 03	2.62E 03	2.32E 03	2.06E 03	1.85E 03	1.69E 03	1.56E 03	1.65E 03	1.00E 00		
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	

I	X/D	S.S.COEFF.
2	3.148E-02	1.386E-02
3	9.443E-02	9.531E-03
4	1.643E-01	6.273E-03

104	0.1046E	00	0.6729E-01	0.3311E-01	0.3271E-01	0.1113E-01	0.9499E	08	0.5403E	01-0.6120E-02	0.1596E	02	0.1771E	04	0.2296E	04
105	0.1030E	00	0.6520E-01	0.3208E-01	0.3163E-01	0.1093E-01	0.9701E	08	0.5392E	01-0.5929E-02	0.1597E	02	0.1772E	04	0.2305E	04
106	0.1014E	00	0.6304E-01	0.3107E-01	0.3056E-01	0.1070E-01	0.9956E	08	0.5382E	01-0.5726E-02	0.1599E	02	0.1772E	04	0.2313E	04
107	0.9982E-01		0.6088E-01	0.3009E-01	0.2953E-01	0.1045E-01	0.1017E	09	0.5372E	01-0.5509E-02	0.1601E	02	0.1773E	04	0.2321E	04
108	0.9830E-01		0.5877E-01	0.2915E-01	0.2865E-01	0.1024E-01	0.1091E	09	0.5360E	01-0.5993E-02	0.1603E	02	0.1775E	04	0.2330E	04
109	0.9449E-01		0.6324E-01	0.2826E-01	0.2773E-01	0.1005E-01	0.1162E	09	0.5348E	01-0.5921E-02	0.1604E	02	0.1776E	04	0.2337E	04
110	0.9344E-01		0.6040E-01	0.2740E-01	0.2651E-01	0.9911E-02	0.1221E	09	0.5336E	01-0.5703E-02	0.1606E	02	0.1777E	04	0.2345E	04
111	0.9106E-01		0.5857E-01	0.2657E-01	0.2552E-01	0.9772E-02	0.1257E	09	0.5325E	01-0.5374E-02	0.1608E	02	0.1778E	04	0.2353E	04
112	0.8949E-01		0.5590E-01	0.2579E-01	0.2447E-01	0.9458E-02	0.1183E	09	0.5315E	01-0.5049E-02	0.1609E	02	0.1778E	04	0.2361E	04
113	0.8768E-01		0.5357E-01	0.2501E-01	0.2336E-01	0.9153E-02	0.1159E	09	0.5305E	01-0.4712E-02	0.1611E	02	0.1779E	04	0.2368E	04
114	0.8597E-01		0.5130E-01	0.2425E-01	0.2237E-01	0.8870E-02	0.1160E	09	0.5295E	01-0.4370E-02	0.1613E	02	0.1780E	04	0.2375E	04
115	0.8427E-01		0.4908E-01	0.2351E-01	0.2146E-01	0.8620E-02	0.1177E	09	0.5286E	01-0.4023E-02	0.1614E	02	0.1781E	04	0.2382E	04
116	0.8261E-01		0.4687E-01	0.2281E-01	0.2059E-01	0.8395E-02	0.1190E	09	0.5277E	01-0.3671E-02	0.1616E	02	0.1782E	04	0.2388E	04
117	0.8086E-01		0.4466E-01	0.2217E-01	0.1977E-01	0.8197E-02	0.1201E	09	0.5268E	01-0.3314E-02	0.1617E	02	0.1783E	04	0.2394E	04
118	0.7911E-01		0.4249E-01	0.2159E-01	0.1894E-01	0.8032E-02	0.1214E	09	0.5261E	01-0.2954E-02	0.1619E	02	0.1784E	04	0.2400E	04
119	0.7737E-01		0.4037E-01	0.2105E-01	0.1836E-01	0.7929E-02	0.1286E	09	0.5252E	01-0.2873E-02	0.1621E	02	0.1785E	04	0.2406E	04
120	0.7424E-01		0.4307E-01	0.2053E-01	0.1763E-01	0.7816E-02	0.1343E	09	0.5244E	01-0.2539E-02	0.1622E	02	0.1786E	04	0.2411E	04
121	0.7260E-01		0.4030E-01	0.2003E-01	0.1681E-01	0.7694E-02	0.1388E	09	0.5236E	01-0.2174E-02	0.1623E	02	0.1788E	04	0.2417E	04
122	0.7045E-01		0.3875E-01	0.1954E-01	0.1610E-01	0.7558E-02	0.1406E	09	0.5230E	01-0.1746E-02	0.1625E	02	0.1788E	04	0.2422E	04
123	0.6885E-01		0.3627E-01	0.1909E-01	0.1545E-01	0.7414E-02	0.1397E	09	0.5224E	01-0.1326E-02	0.1626E	02	0.1789E	04	0.2426E	04
124	0.6714E-01		0.3414E-01	0.1868E-01	0.1478E-01	0.7267E-02	0.1388E	09	0.5219E	01-0.8983E-03	0.1628E	02	0.1790E	04	0.2431E	04
125	0.6553E-01		0.3209E-01	0.1833E-01	0.1418E-01	0.7123E-02	0.1377E	09	0.5214E	01-0.4844E-03	0.1629E	02	0.1791E	04	0.2435E	04
126	0.6396E-01		0.3020E-01	0.1801E-01	0.1358E-01	0.6996E-02	0.1380E	09	0.5210E	01-0.8050E-04	0.1630E	02	0.1792E	04	0.2439E	04
127	0.6247E-01		0.2848E-01	0.1770E-01	0.1305E-01	0.6873E-02	0.1373E	09	0.5207E	01 0.3085E-03	0.1631E	02	0.1793E	04	0.2443E	04
128	0.6112E-01		0.2680E-01	0.1743E-01	0.1251E-01	0.6738E-02	0.1376E	09	0.5204E	01 0.6822E-03	0.1632E	02	0.1794E	04	0.2447E	04
129	0.5993E-01		0.2525E-01	0.1716E-01	0.1199E-01	0.6596E-02	0.1378E	09	0.5202E	01 0.1039E-02	0.1634E	02	0.1795E	04	0.2451E	04
130	0.5876E-01		0.2382E-01	0.1693E-01	0.1150E-01	0.6450E-02	0.1376E	09	0.5201E	01 0.1377E-02	0.1635E	02	0.1796E	04	0.2454E	04
131	0.5762E-01		0.2257E-01	0.1672E-01	0.1108E-01	0.6298E-02	0.1373E	09	0.5200E	01 0.1697E-02	0.1636E	02	0.1797E	04	0.2457E	04
132	0.5659E-01		0.2149E-01	0.1655E-01	0.1065E-01	0.6147E-02	0.1376E	09	0.5200E	01 0.1997E-02	0.1637E	02	0.1798E	04	0.2460E	04
133	0.5561E-01		0.2049E-01	0.1639E-01	0.1027E-01	0.5998E-02	0.1372E	09	0.5201E	01 0.2278E-02	0.1638E	02	0.1799E	04	0.2463E	04
134	0.5471E-01		0.1958E-01	0.1624E-01	0.9892E-02	0.5856E-02	0.1371E	09	0.5202E	01 0.2539E-02	0.1639E	02	0.1800E	04	0.2466E	04
135	0.5391E-01		0.1876E-01	0.1611E-01	0.9564E-02	0.5719E-02	0.1375E	09	0.5203E	01 0.2779E-02	0.1640E	02	0.1801E	04	0.2463E	04
136	0.5312E-01		0.1802E-01	0.1599E-01	0.9222E-02	0.5588E-02	0.1372E	09	0.5205E	01 0.3000E-02	0.1640E	02	0.1802E	04	0.2471E	04
137	0.5230E-01		0.1741E-01	0.1589E-01	0.8929E-02	0.5456E-02	0.1373E	09	0.5207E	01 0.3201E-02	0.1641E	02	0.1803E	04	0.2473E	04
138	0.5144E-01		0.1695E-01	0.1581E-01	0.8672E-02	0.5325E-02	0.1375E	09	0.5210E	01 0.3381E-02	0.1642E	02	0.1804E	04	0.2475E	04
139	0.5062E-01		0.1654E-01	0.1574E-01	0.8409E-02	0.5193E-02	0.1373E	09	0.5213E	01 0.3543E-02	0.1643E	02	0.1805E	04	0.2477E	04
140	0.4979E-01		0.1628E-01	0.1569E-01	0.8179E-02	0.5063E-02	0.1375E	09	0.5217E	01 0.3686E-02	0.1644E	02	0.1806E	04	0.2479E	04
141	0.4893E-01		0.1620E-01	0.1565E-01	0.8025E-02	0.4939E-02	0.1380E	09	0.5221E	01 0.3809E-02	0.1644E	02	0.1807E	04	0.2480E	04
142	0.4806E-01		0.1628E-01	0.1561E-01	0.7843E-02	0.4821E-02	0.1372E	09	0.5225E	01 0.3914E-02	0.1645E	02	0.1807E	04	0.2482E	04
143	0.4719E-01		0.1647E-01	0.1559E-01	0.7666E-02	0.4711E-02	0.1371E	09	0.5229E	01 0.4001E-02	0.1646E	02	0.1808E	04	0.2484E	04
144	0.4631E-01		0.1668E-01	0.1562E-01	0.7536E-02	0.4611E-02	0.1373E	09	0.5234E	01 0.4071E-02	0.1647E	02	0.1809E	04	0.2485E	04
145	0.4541E-01		0.1691E-01	0.1565E-01	0.7460E-02	0.4513E-02	0.1372E	09	0.5239E	01 0.4125E-02	0.1647E	02	0.1810E	04	0.2486E	04
146	0.4449E-01		0.1712E-01	0.1572E-01	0.7352E-02	0.4416E-02	0.1369E	09	0.5244E	01 0.4163E-02	0.1648E	02	0.1811E	04	0.2487E	04
147	0.4358E-01		0.1731E-01	0.1580E-01	0.7255E-02	0.4326E-02	0.1366E	09	0.5249E	01 0.4185E-02	0.1649E	02	0.1812E	04	0.2489E	04
148	0.4267E-01		0.1748E-01	0.1590E-01	0.7227E-02	0.4247E-02	0.1368E	09	0.5255E	01 0.4192E-02	0.1649E	02	0.1812E	04	0.2490E	04
149	0.4176E-01		0.1763E-01	0.1600E-01	0.7159E-02	0.4181E-02	0.1364E	09	0.5260E	C1 0.4187E-02	0.1650E	02	0.1813E	04	0.2491E	04
150	0.4084E-01		0.1775E-01	0.1610E-01	0.7134E-02	0.4118E-02	0.1360E	09	0.5266E	01 0.4168E-02	0.1650E	02	0.1814E	04	0.2491E	04
151	0.3992E-01		0.1786E-01	0.1620E-01	0.7152E-02	0.4062E-02	0.1356E	09	0.5272E	01 0.4137E-02	0.1651E	02	0.1815E	04	0.2492E	04
152	0.3900E-01		0.1796E-01	0.1630E-01	0.7125E-02	0.4015E-02	0.1351E	09	0.5278E	01 0.4093E-02	0.1652E	02	0.1816E	04	0.2493E	04
153	0.3808E-01		0.1804E-01	0.1640E-01	0.7131E-02	0.3973E-02	0.1345E	09	0.5283E	01 0.4040E-02	0.1652E	02	0.1816E	04	0.2494E	04
154	0.3717E-01		0.1808E-01	0.1649E-01	0.7128E-02	0.3931E-02	0.1344E	09	0.5289E	01 0.3976E-02	0.1653E	02	0.1817E	04	0.2495E	04
155	0.3633E-01		0.1812E-01	0.1657E-01	0.7171E-02	0.3823E-02	0.1232E	09	0.5295E	01 0.3910E-02	0.1653E	02	0.1818E	04	0.2495E	04
156	0.3550E-01		0.1810E-01	0.1665E-01	0.7192E-02	0.3742E-02	0.1207E	09	0.5301E	01 0.3837E-02	0.1654E	02	0.1819E	04	0.2496E	04
157	0.3468E-01		0.1807E-01	0.1673E-01	0.7263E-02	0.3676E-02	0.1207E	09	0.5307E	01 0.3757E-02	0.1654E	02	0.1819E	04	0.2496E	04

9	0.25750	3.49E 05	3.51E 05	3.52E 05	3.53E 05	3.54E 05	3.55E 05	3.55E 05	3.56E 05	3.57E 05	3.57E 05	0.00	
8	0.24250	3.43E 05	3.45E 05	3.47E 05	3.48E 05	3.49E 05	3.50E 05	3.51E 05	3.52E 05	3.53E 05	3.54E 05	0.00	
7	0.21500	3.31E 05	3.35E 05	3.37E 05	3.40E 05	3.41E 05	3.43E 05	3.44E 05	3.46E 05	3.47E 05	3.48E 05	0.00	
6	0.17500	3.15E 05	3.20E 05	3.25E 05	3.28E 05	3.31E 05	3.33E 05	3.36E 05	3.37E 05	3.39E 05	3.41E 05	0.00	
5	0.13000	2.99E 05	3.07E 05	3.13E 05	3.18E 05	3.22E 05	3.25E 05	3.28E 05	3.30E 05	3.32E 05	3.34E 05	0.00	
4	0.08500	2.87E 05	2.97E 05	3.04E 05	3.10E 05	3.15E 05	3.18E 05	3.22E 05	3.25E 05	3.27E 05	3.30E 05	0.00	
3	0.04500	2.81E 05	2.91E 05	2.99E 05	3.06E 05	3.11E 05	3.15E 05	3.19E 05	3.22E 05	3.24E 05	3.27E 05	0.00	
2	0.01250	2.78E 05	2.89E 05	2.97E 05	3.04E 05	3.09E 05	3.14E 05	3.18E 05	3.21E 05	3.23E 05	3.26E 05	0.00	
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*													
DIMENSIONLESS TURBULENCE ENERGY													
--*-*-*-*-*-*-*-*-*-*-*-*-*-*													
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0	J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	2.97E-03	2.49E-03	2.07E-03	1.79E-03	1.59E-03	1.47E-03	1.54E-03	1.95E-03
19	0.47500	0.00	0.00	0.00	0.00	1.51E-02	1.44E-02	1.11E-02	8.49E-03	6.64E-03	5.57E-03	6.48E-03	9.57E-03
18	0.44750	0.00	0.00	0.00	0.00	1.99E-02	1.48E-02	1.15E-02	9.16E-03	7.53E-03	7.30E-03	1.07E-02	1.54E-02
17	0.42750	0.00	0.00	0.00	7.02E-03	1.16E-02	9.83E-03	8.59E-03	7.74E-03	7.29E-03	9.40E-03	1.48E-02	1.95E-02
16	0.40625	0.00	0.00	0.00	2.27E-02	1.38E-02	9.94E-03	8.01E-03	7.21E-03	8.22E-03	1.35E-02	1.98E-02	2.38E-02
15	0.38500	0.00	0.00	0.00	1.95E-02	1.15E-02	8.69E-03	7.27E-03	7.43E-03	1.18E-02	1.92E-02	2.50E-02	2.79E-02
14	0.36500	0.00	0.00	8.79E-03	1.17E-02	9.65E-03	8.35E-03	7.70E-03	1.01E-02	1.75E-02	2.49E-02	2.96E-02	3.13E-02
13	0.34625	0.00	0.00	2.57E-02	1.33E-02	1.00E-02	9.32E-03	9.94E-03	1.54E-02	2.36E-02	2.99E-02	3.33E-02	3.41E-02
12	0.32750	0.00	0.00	2.08E-02	1.10E-02	1.01E-02	1.09E-02	1.40E-02	2.17E-02	2.92E-02	3.42E-02	3.65E-02	3.64E-02
11	0.29750	0.00	1.25E-02	1.41E-02	9.26E-03	1.13E-02	1.49E-02	2.34E-02	3.17E-02	3.68E-02	3.96E-02	4.04E-02	3.93E-02
10	0.27500	0.00	4.27E-02	1.63E-02	9.21E-03	1.42E-02	2.29E-02	3.07E-02	3.66E-02	4.03E-02	4.22E-02	4.23E-02	4.07E-02
9	0.25750	0.00	4.53E-02	1.14E-02	8.64E-03	1.80E-02	2.81E-02	3.44E-02	3.90E-02	4.20E-02	4.34E-02	4.33E-02	4.14E-02
8	0.24250	3.00E-02	9.97E-03	4.80E-03	9.27E-03	2.25E-02	3.17E-02	3.63E-02	4.01E-02	4.28E-02	4.41E-02	4.38E-02	4.18E-02
7	0.21500	3.00E-02	9.94E-03	5.46E-03	1.28E-02	3.04E-02	3.57E-02	3.79E-02	4.11E-02	4.35E-02	4.45E-02	4.40E-02	4.19E-02
6	0.17500	3.00E-02	9.96E-03	7.32E-03	2.14E-02	4.62E-02	3.64E-02	3.83E-02	4.10E-02	4.32E-02	4.41E-02	4.34E-02	4.13E-02
5	0.13000	3.00E-02	1.00E-02	1.30E-02	4.15E-02	3.66E-02	3.57E-02	3.75E-02	3.98E-02	4.17E-02	4.25E-02	4.18E-02	3.98E-02
4	0.08500	3.00E-02	1.03E-02	2.99E-02	6.46E-02	3.46E-02	3.50E-02	3.64E-02	3.83E-02	3.99E-02	4.06E-02	4.00E-02	3.82E-02
3	0.04500	3.00E-02	1.15E-02	7.18E-02	4.97E-02	3.45E-02	3.45E-02	3.56E-02	3.72E-02	3.87E-02	3.94E-02	3.89E-02	3.72E-02
2	0.01250	3.00E-02	1.98E-02	5.33E-02	4.54E-02	3.45E-02	3.43E-02	3.54E-02	3.70E-02	3.84E-02	3.91E-02	3.85E-02	3.69E-02
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	I =	13	14	15	16	17	18	19	20	21	22	23	
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015	
0	J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	2.33E-03	2.44E-03	2.35E-03	2.18E-03	2.00E-03	1.83E-03	1.70E-03	1.59E-03	1.50E-03	1.47E-03	3.00E-02	
19	0.47500	1.18E-02	1.21E-02	1.11E-02	9.43E-03	7.74E-03	6.23E-03	5.02E-03	4.12E-03	3.46E-03	3.52E-03	3.00E-02	
18	0.44750	1.78E-02	1.76E-02	1.58E-02	1.33E-02	1.08E-02	8.65E-03	6.91E-03	5.61E-03	4.64E-03	4.89E-03	3.00E-02	
17	0.42750	2.14E-02	2.06E-02	1.82E-02	1.52E-02	1.23E-02	9.84E-03	7.86E-03	6.38E-03	5.28E-03	5.68E-03	3.00E-02	
16	0.40625	2.48E-02	2.33E-02	2.03E-02	1.69E-02	1.36E-02	1.09E-02	8.68E-03	7.06E-03	5.86E-03	6.39E-03	3.00E-02	
15	0.38500	2.79E-02	2.56E-02	2.21E-02	1.83E-02	1.47E-02	1.17E-02	9.37E-03	7.64E-03	6.36E-03	6.98E-03	3.00E-02	
14	0.36500	3.04E-02	2.75E-02	2.35E-02	1.94E-02	1.56E-02	1.24E-02	9.92E-03	8.10E-03	6.76E-03	7.42E-03	3.00E-02	
13	0.34625	3.25E-02	2.91E-02	2.47E-02	2.03E-02	1.63E-02	1.29E-02	1.04E-02	8.47E-03	7.07E-03	7.76E-03	3.00E-02	
12	0.32750	3.42E-02	3.03E-02	2.57E-02	2.10E-02	1.68E-02	1.34E-02	1.07E-02	8.77E-03	7.34E-03	8.02E-03	3.00E-02	
11	0.29750	3.63E-02	3.19E-02	2.68E-02	2.19E-02	1.75E-02	1.39E-02	1.12E-02	9.16E-03	7.68E-03	8.30E-03	3.00E-02	
10	0.27500	3.74E-02	3.27E-02	2.74E-02	2.23E-02	1.79E-02	1.42E-02	1.14E-02	9.38E-03	7.87E-03	8.42E-03	3.00E-02	
9	0.25750	3.79E-02	3.30E-02	2.77E-02	2.26E-02	1.81E-02	1.44E-02	1.16E-02	9.50E-03	7.97E-03	8.46E-03	3.00E-02	
8	0.24250	3.81E-02	3.32E-02	2.78E-02	2.27E-02	1.82E-02	1.45E-02	1.17E-02	9.57E-03	8.04E-03	8.46E-03	3.00E-02	
7	0.21500	3.82E-02	3.32E-02	2.78E-02	2.27E-02	1.83E-02	1.46E-02	1.17E-02	9.65E-03	8.10E-03	8.40E-03	3.00E-02	
6	0.17500	3.77E-02	3.28E-02	2.75E-02	2.25E-02	1.81E-02	1.45E-02	1.17E-02	9.66E-03	8.12E-03	8.21E-03	3.00E-02	
5	0.13000	3.65E-02	3.19E-02	2.68E-02	2.20E-02	1.78E-02	1.44E-02	1.16E-02	9.59E-03	8.07E-03	7.95E-03	3.00E-02	

DIMENSIONLESS STREAMLINE PLOT																
OITER	I---	ABSOLUTE RESIDUAL			SOURCE SUMS		---	I---	FIELD VALUES AT MONITORING LOCATION(22, 8) ---I							
NO	UMON	VMON	WMON	MASS	TKIN	DISP			U	V	W	P				D
1	0.1031E-01	0.5975E-02	0.1857E 00	0.2804E-02	0.5508E-02	0.4766E 10	0.6454E 01	0.6346E-03	0.1102E 02	0.1165E 04	0.9597E 03					
2	0.1030E-01	0.1534E 00	0.1616E 00	0.1839E-01	0.8486E-02	0.7190E 10	0.6456E 01	0.6544E-03	0.1103E 02	0.1347E 04	0.9597E 03					
3	0.7791E-01	0.2200E 00	0.1452E 00	0.2851E-01	0.1025E-01	0.7882E 10	0.6457E 01	0.2855E-03	0.1103E 02	0.1534E 04	0.9596E 03					
4	0.2046E 00	0.1976E 00	0.1336E 00	0.1916E-01	0.1072E-01	0.6360E 10	0.6457E 01	0.1847E-03	0.1104E 02	0.1524E 04	0.9597E 03					
5	0.2141E 00	0.2127E 00	0.1265E 00	0.2178E-01	0.1167E-01	0.4419E 10	0.6457E 01	0.1798E-03	0.1104E 02	0.1498E 04	0.9597E 03					
6	0.2351E 00	0.2178E 00	0.1224E 00	0.2372E-01	0.1282E-01	0.4815E 10	0.6458E 01	0.1865E-03	0.1105E 02	0.1460E 04	0.9598E 03					
7	0.2473E 00	0.2210E 00	0.1201E 00	0.2526E-01	0.1353E-01	0.4804E 10	0.6458E 01	0.1961E-03	0.1106E 02	0.1421E 04	0.9599E 03					
8	0.2540E 00	0.2244E 00	0.1185E 00	0.2667E-01	0.1399E-01	0.4929E 10	0.6459E 01	0.2072E-03	0.1106E 02	0.1385E 04	0.9600E 03					
9	0.2602E 00	0.2257E 00	0.1175E 00	0.2765E-01	0.1429E-01	0.4564E 10	0.6459E 01	0.2172E-03	0.1107E 02	0.1352E 04	0.9601E 03					
10	0.2655E 00	0.2254E 00	0.1165E 00	0.2875E-01	0.1453E-01	0.4028E 10	0.6460E 01	0.2285E-03	0.1107E 02	0.1324E 04	0.9602E 03					
11	0.2687E 00	0.2252E 00	0.1160E 00	0.2949E-01	0.1478E-01	0.3516E 10	0.6460E 01	0.2399E-03	0.1108E 02	0.1300E 04	0.9603E 03					
12	0.2716E 00	0.2259E 00	0.1155E 00	0.3027E-01	0.1509E-01	0.3282E 10	0.6461E 01	0.2515E-03	0.1108E 02	0.1281E 04	0.9604E 03					
13	0.2749E 00	0.2250E 00	0.1151E 00	0.3105E-01	0.1547E-01	0.3120E 10	0.6462E 01	0.2630E-03	0.1109E 02	0.1266E 04	0.9606E 03					
14	0.2773E 00	0.2228E 00	0.1146E 00	0.3180E-01	0.1591E-01	0.2996E 10	0.6462E 01	0.2756E-03	0.1109E 02	0.1256E 04	0.9607E 03					
15	0.2791E 00	0.2200E 00	0.1147E 00	0.3280E-01	0.1645E-01	0.2895E 10	0.6463E 01	0.2884E-03	0.1110E 02	0.1249E 04	0.9609E 03					
16	0.2802E 00	0.2166E 00	0.1150E 00	0.3356E-01	0.1703E-01	0.2806E 10	0.6464E 01	0.3016E-03	0.1111E 02	0.1245E 04	0.9611E 03					
17	0.2811E 00	0.2136E 00	0.1152E 00	0.3409E-01	0.1765E-01	0.2725E 10	0.6464E 01	0.3155E-03	0.1111E 02	0.1243E 04	0.9613E 03					
18	0.2816E 00	0.2099E 00	0.1152E 00	0.3458E-01	0.1842E-01	0.2649E 10	0.6465E 01	0.3284E-03	0.1112E 02	0.1243E 04	0.9614E 03					
19	0.2815E 00	0.2068E 00	0.1153E 00	0.3480E-01	0.1922E-01	0.2577E 10	0.6466E 01	0.3419E-03	0.1112E 02	0.1244E 04	0.9616E 03					
20	0.2809E 00	0.2040E 00	0.1153E 00	0.3500E-01	0.1995E-01	0.2507E 10	0.6467E 01	0.3548E-03	0.1113E 02	0.1245E 04	0.9618E 03					
21	0.2800E 00	0.2016E 00	0.1153E 00	0.3488E-01	0.2051E-01	0.2439E 10	0.6467E 01	0.3686E-03	0.1113E 02	0.1247E 04	0.9620E 03					
22	0.2791E 00	0.1988E 00	0.1152E 00	0.3449E-01	0.2105E-01	0.2372E 10	0.6468E 01	0.3813E-03	0.1114E 02	0.1250E 04	0.9622E 03					
23	0.2780E 00	0.1959E 00	0.1150E 00	0.3381E-01	0.2157E-01	0.2304E 10	0.6469E 01	0.3932E-03	0.1115E 02	0.1252E 04	0.9624E 03					
24	0.2774E 00	0.1929E 00	0.1147E 00	0.3349E-01	0.2196E-01	0.2236E 10	0.6470E 01	0.4050E-03	0.1115E 02	0.1255E 04	0.9627E 03					
25	0.2765E 00	0.1904E 00	0.1144E 00	0.3285E-01	0.2223E-01	0.2165E 10	0.6471E 01	0.4159E-03	0.1116E 02	0.1258E 04	0.9629E 03					
26	0.2745E 00	0.1876E 00	0.1139E 00	0.3240E-01	0.2259E-01	0.2094E 10	0.6472E 01	0.4259E-03	0.1116E 02	0.1261E 04	0.9631E 03					
27	0.2716E 00	0.1845E 00	0.1134E 00	0.3170E-01	0.2278E-01	0.2023E 10	0.6473E 01	0.4345E-03	0.1117E 02	0.1263E 04	0.9634E 03					
28	0.2693E 00	0.1809E 00	0.1129E 00	0.3069E-01	0.2285E-01	0.1955E 10	0.6474E 01	0.4409E-03	0.1117E 02	0.1266E 04	0.9636E 03					
29	0.2661E 00	0.1774E 00	0.1123E 00	0.3062E-01	0.2307E-01	0.1889E 10	0.6475E 01	0.4465E-03	0.1118E 02	0.1268E 04	0.9639E 03					
30	0.2632E 00	0.1745E 00	0.1117E 00	0.3057E-01	0.2327E-01	0.1817E 10	0.6476E 01	0.4487E-03	0.1119E 02	0.1269E 04	0.9642E 03					
31	0.2600E 00	0.1720E 00	0.1111E 00	0.3068E-01	0.2336E-01	0.1740E 10	0.6477E 01	0.4492E-03	0.1119E 02	0.1271E 04	0.9645E 03					
32	0.2558E 00	0.1689E 00	0.1104E 00	0.3054E-01	0.2350E-01	0.1660E 10	0.6478E 01	0.4453E-03	0.1120E 02	0.1272E 04	0.9648E 03					
33	0.2518E 00	0.1654E 00	0.1098E 00	0.3061E-01	0.2381E-01	0.1577E 10	0.6479E 01	0.4383E-03	0.1120E 02	0.1273E 04	0.9652E 03					
34	0.2480E 00	0.1616E 00	0.1090E 00	0.3079E-01	0.2418E-01	0.1491E 10	0.6480E 01	0.4269E-03	0.1121E 02	0.1274E 04	0.9656E 03					
35	0.2439E 00	0.1582E 00	0.1082E 00	0.3115E-01	0.2454E-01	0.1404E 10	0.6481E 01	0.4105E-03	0.1122E 02	0.1275E 04	0.9660E 03					
36	0.2396E 00	0.1552E 00	0.1074E 00	0.3133E-01	0.2495E-01	0.1326E 10	0.6482E 01	0.3872E-03	0.1122E 02	0.1275E 04	0.9664E 03					
37	0.2352E 00	0.1524E 00	0.1065E 00	0.3145E-01	0.2545E-01	0.1248E 10	0.6483E 01	0.3575E-03	0.1123E 02	0.1275E 04	0.9669E 03					
38	0.2309E 00	0.1490E 00	0.1058E 00	0.3183E-01	0.2595E-01	0.1166E 10	0.6484E 01	0.3198E-03	0.1123E 02	0.1276E 04	0.9674E 03					
39	0.2267E 00	0.1456E 00	0.1052E 00	0.3228E-01	0.2641E-01	0.1082E 10	0.6485E 01	0.2738E-03	0.1124E 02	0.1276E 04	0.9680E 03					
40	0.2222E 00	0.1423E 00	0.1045E 00	0.3291E-01	0.2694E-01	0.1003E 10	0.6486E 01	0.2176E-03	0.1124E 02	0.1276E 04	0.9687E 03					
41	0.2175E 00	0.1395E 00	0.1037E 00	0.3331E-01	0.2739E-01	0.9180E 09	0.6487E 01	0.1507E-03	0.1125E 02	0.1275E 04	0.9694E 03					
42	0.2131E 00	0.1353E 00	0.1031E 00	0.3353E-01	0.2774E-01	0.8309E 09	0.6488E 01	0.7538E-04	0.1126E 02	0.1275E 04	0.9701E 03					
43	0.2082E 00	0.1315E 00	0.1027E 00	0.3386E-01	0.2807E-01	0.7455E 09	0.6488E 01	-0.7680E-05	0.1126E 02	0.1275E 04	0.9709E 03					
44	0.2039E 00	0.1274E 00	0.1022E 00	0.3418E-01	0.2835E-01	0.6767E 09	0.6489E 01	-0.9840E-04	0.1127E 02	0.1275E 04	0.9718E 03					
45	0.1997E 00	0.1237E 00	0.1017E 00	0.3456E-01	0.2853E-01	0.6121E 09	0.6489E 01	-0.1964E-03	0.1127E 02	0.1275E 04	0.9728E 03					
46	0.1960E 00	0.1204E 00	0.1011E 00	0.3500E-01	0.2868E-01	0.5546E 09	0.6490E 01	-0.3031E-03	0.1128E 02	0.1275E 04	0.9738E 03					
47	0.1925E 00	0.1174E 00	0.1006E 00	0.3544E-01	0.2881E-01	0.5156E 09	0.6490E 01	-0.4178E-03	0.1129E 02	0.1275E 04	0.9749E 03					

20	0.06187	0.00	0.00	0.00	0.00	1.36E 03	1.39E 03	1.32E 03	1.31E 03	1.32E 03	1.34E 03	1.35E 03	1.36E 03
19	0.05937	0.00	0.00	0.00	0.00	1.32E 03	1.36E 03	1.31E 03	1.29E 03	1.31E 03	1.32E 03	1.33E 03	1.34E 03
18	0.05594	0.00	0.00	0.00	0.00	1.26E 03	1.33E 03	1.27E 03	1.27E 03	1.28E 03	1.30E 03	1.31E 03	1.31E 03
17	0.05344	0.00	0.00	0.00	1.34E 03	1.25E 03	1.28E 03	1.25E 03	1.25E 03	1.26E 03	1.28E 03	1.29E 03	1.29E 03
16	0.05078	0.00	0.00	0.00	1.26E 03	1.25E 03	1.24E 03	1.21E 03	1.22E 03	1.24E 03	1.26E 03	1.26E 03	1.26E 03
15	0.04812	0.00	0.00	0.00	1.15E 03	1.21E 03	1.19E 03	1.18E 03	1.20E 03	1.22E 03	1.23E 03	1.23E 03	1.23E 03
14	0.04562	0.00	0.00	1.37E 03	1.13E 03	1.16E 03	1.14E 03	1.14E 03	1.17E 03	1.19E 03	1.20E 03	1.20E 03	1.20E 03
13	0.04328	0.00	0.00	1.25E 03	1.15E 03	1.12E 03	1.10E 03	1.11E 03	1.14E 03	1.16E 03	1.17E 03	1.17E 03	1.17E 03
12	0.04094	0.00	0.00	1.08E 03	1.11E 03	1.07E 03	1.06E 03	1.08E 03	1.11E 03	1.13E 03	1.14E 03	1.14E 03	1.14E 03
11	0.03719	0.00	1.03E 03	9.72E 02	1.02E 03	9.96E 02	9.93E 02	1.02E 03	1.05E 03	1.07E 03	1.08E 03	1.09E 03	1.09E 03
10	0.03437	0.00	8.07E 02	9.37E 02	9.61E 02	9.40E 02	9.46E 02	9.76E 02	1.00E 03	1.02E 03	1.04E 03	1.04E 03	1.05E 03
9	0.03219	0.00	5.68E 02	8.82E 02	9.11E 02	8.97E 02	9.12E 02	9.40E 02	9.65E 02	9.84E 02	9.99E 02	1.01E 03	1.02E 03
8	0.03031	0.00	4.78E 02	8.21E 02	8.74E 02	8.64E 02	8.83E 02	9.07E 02	9.31E 02	9.51E 02	9.67E 02	9.82E 02	9.94E 02
7	0.02687	0.00	5.24E 02	7.44E 02	8.09E 02	8.06E 02	8.26E 02	8.46E 02	8.68E 02	8.89E 02	9.10E 02	9.29E 02	9.47E 02
6	0.02187	0.00	5.16E 02	6.57E 02	7.10E 02	7.28E 02	7.40E 02	7.57E 02	7.79E 02	8.03E 02	8.30E 02	8.57E 02	8.82E 02
5	0.01625	0.00	4.43E 02	5.66E 02	6.03E 02	6.22E 02	6.47E 02	6.66E 02	6.90E 02	7.18E 02	7.51E 02	7.86E 02	8.19E 02
4	0.01062	0.00	3.10E 02	4.61E 02	5.24E 02	5.43E 02	5.70E 02	5.95E 02	6.21E 02	6.53E 02	6.91E 02	7.31E 02	7.71E 02
3	0.00562	0.00	1.24E 02	4.08E 02	4.61E 02	4.94E 02	5.25E 02	5.53E 02	5.81E 02	6.16E 02	6.56E 02	7.00E 02	7.43E 02
2	0.00156	0.00	0.00	3.34E 02	4.33E 02	4.74E 02	5.08E 02	5.37E 02	5.67E 02	6.02E 02	6.43E 02	6.88E 02	7.33E 02
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 0.15786 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.37E 03	1.37E 03	1.38E 03	1.38E 03	1.37E 03	1.37E 03	1.36E 03	1.35E 03	1.35E 03	1.34E 03	0.00	0.00
19	0.05937	1.35E 03	1.35E 03	1.35E 03	1.35E 03	1.34E 03	1.34E 03	1.33E 03	1.33E 03	1.32E 03	1.31E 03	0.00	0.00
18	0.05594	1.31E 03	1.31E 03	1.31E 03	1.31E 03	1.30E 03	1.30E 03	1.29E 03	1.29E 03	1.28E 03	1.28E 03	0.00	0.00
17	0.05344	1.29E 03	1.29E 03	1.28E 03	1.28E 03	1.27E 03	1.27E 03	1.26E 03	1.26E 03	1.25E 03	1.25E 03	0.00	0.00
16	0.05078	1.26E 03	1.25E 03	1.25E 03	1.25E 03	1.24E 03	1.24E 03	1.23E 03	1.23E 03	1.22E 03	1.22E 03	0.00	0.00
15	0.04812	1.23E 03	1.22E 03	1.22E 03	1.21E 03	1.21E 03	1.21E 03	1.20E 03	1.20E 03	1.20E 03	1.19E 03	0.00	0.00
14	0.04562	1.20E 03	1.19E 03	1.19E 03	1.19E 03	1.18E 03	1.18E 03	1.18E 03	1.17E 03	1.17E 03	1.17E 03	0.00	0.00
13	0.04328	1.17E 03	1.17E 03	1.16E 03	1.16E 03	1.16E 03	1.15E 03	1.15E 03	1.15E 03	1.15E 03	1.15E 03	0.00	0.00
12	0.04094	1.14E 03	1.14E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	0.00	0.00
11	0.03719	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	0.00	0.00
10	0.03437	1.06E 03	1.06E 03	1.06E 03	1.06E 03	1.06E 03	1.06E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	0.00	0.00
9	0.03219	1.03E 03	1.03E 03	1.04E 03	1.04E 03	1.04E 03	1.04E 03	1.05E 03	1.05E 03	1.05E 03	1.06E 03	0.00	0.00
8	0.03031	1.00E 03	1.01E 03	1.02E 03	1.02E 03	1.02E 03	1.03E 03	1.03E 03	1.04E 03	1.04E 03	1.04E 03	0.00	0.00
7	0.02687	9.62E 02	9.73E 02	9.82E 02	9.89E 02	9.96E 02	1.00E 03	1.01E 03	1.01E 03	1.02E 03	1.02E 03	0.00	0.00
6	0.02187	9.04E 02	9.22E 02	9.36E 02	9.48E 02	9.58E 02	9.67E 02	9.74E 02	9.81E 02	9.87E 02	9.93E 02	0.00	0.00
5	0.01625	8.49E 02	8.74E 02	8.94E 02	9.10E 02	9.24E 02	9.35E 02	9.45E 02	9.54E 02	9.62E 02	9.69E 02	0.00	0.00
4	0.01062	8.07E 02	8.37E 02	8.62E 02	8.82E 02	8.99E 02	9.12E 02	9.24E 02	9.34E 02	9.43E 02	9.52E 02	0.00	0.00
3	0.00562	7.83E 02	8.17E 02	8.44E 02	8.67E 02	8.85E 02	9.00E 02	9.13E 02	9.24E 02	9.33E 02	9.42E 02	0.00	0.00
2	0.00156	7.74E 02	8.09E 02	8.39E 02	8.61E 02	8.80E 02	8.95E 02	9.09E 02	9.20E 02	9.29E 02	9.39E 02	0.00	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- - - - - PRESSURE - - - - -
0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	2.05E-02	1.67E-02	4.42E-02	5.15E-02	4.87E-02	4.51E-02	4.52E-02	4.80E-02
19	0.05937	0.00	0.00	0.00	0.00	2.63E-02	1.80E-02	4.38E-02	5.00E-02	4.72E-02	4.34E-02	4.21E-02	4.34E-02
18	0.05594	0.00	0.00	0.00	0.00	3.78E-02	2.21E-02	4.42E-02	4.82E-02	4.46E-02	4.00E-02	3.72E-02	3.63E-02
17	0.05344	0.00	0.00	0.00	-1.09E-02	3.30E-02	2.93E-02	4.57E-02	4.70E-02	4.26E-02	3.70E-02	3.31E-02	3.06E-02
16	0.05078	0.00	0.00	0.00	3.25E-03	2.45E-02	3.50E-02	4.70E-02	4.56E-02	3.98E-02	3.34E-02	2.82E-02	2.42E-02

0	J	Y	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
11	1.000000	0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.900000	0.00	2.37E-01	2.94E-01	3.62E-01	4.25E-01	4.79E-01	4.86E-01	4.87E-01	4.86E-01	4.85E-01	4.84E-01	4.83E-01
9	0.800000	0.00	2.23E-01	2.75E-01	3.49E-01	4.12E-01	4.62E-01	4.73E-01	4.74E-01	4.73E-01	4.71E-01	4.69E-01	4.67E-01
8	0.700000	0.00	2.09E-01	2.55E-01	3.33E-01	3.99E-01	4.46E-01	4.60E-01	4.62E-01	4.60E-01	4.57E-01	4.54E-01	4.50E-01
7	0.600000	0.00	1.93E-01	2.37E-01	3.15E-01	3.84E-01	4.32E-01	4.48E-01	4.50E-01	4.47E-01	4.43E-01	4.37E-01	4.32E-01
6	0.500000	0.00	1.77E-01	2.19E-01	2.96E-01	3.69E-01	4.18E-01	4.35E-01	4.37E-01	4.34E-01	4.28E-01	4.20E-01	4.12E-01
5	0.400000	0.00	1.57E-01	1.99E-01	2.76E-01	3.53E-01	4.04E-01	4.23E-01	4.24E-01	4.19E-01	4.11E-01	4.01E-01	3.91E-01
4	0.300000	0.00	1.36E-01	1.78E-01	2.54E-01	3.36E-01	3.89E-01	4.09E-01	4.11E-01	4.04E-01	3.93E-01	3.80E-01	3.67E-01
3	0.200000	0.00	1.10E-01	1.52E-01	2.31E-01	3.17E-01	3.73E-01	3.95E-01	3.95E-01	3.86E-01	3.71E-01	3.54E-01	3.37E-01
2	0.100000	0.00	7.75E-02	1.21E-01	2.02E-01	2.95E-01	3.56E-01	3.79E-01	3.78E-01	3.65E-01	3.43E-01	3.20E-01	2.98E-01
1	0.000000	0.00	0.00	5.39E-02	1.63E-01	2.69E-01	3.35E-01	3.60E-01	3.56E-01	3.33E-01	3.01E-01	2.66E-01	2.21E-01
0	I =	13	14	15	16	17	18	19	20	21	22	23	

RADIAL POSITION 2R/D

[illegible]


```

4 0.01062 -1.52E 00-2.38E-02 1.18E 00 2.09E 00 2.74E 00 3.19E 00 3.50E 00 3.67E 00 3.77E 00 3.79E 00 3.79E 00
3 0.00562 -2.27E 00-6.60E-01 6.55E-01 1.65E 00 2.38E 00 2.88E 00 3.23E 00 3.43E 00 3.53E 00 3.56E 00 3.56E 00
2 0.00156 -2.55E 00-8.92E-01 4.62E-01 1.49E 00 2.25E 00 2.77E 00 3.13E 00 3.34E 00 3.45E 00 3.48E 00 3.48E 00
1-0.00156 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
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0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552
0 J Y
21 0.06250 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06062 0.00 0.00 0.00 0.00 0.00 1.51E 00 1.02E 00 1.34E-01-1.17E-01-1.28E-01-9.74E-02-8.24E-02-6.78E-02
19 0.05766 0.00 0.00 0.00 0.00 0.00 5.17E 00 2.26E 00 2.31E-01-3.60E-01-3.93E-01-3.23E-01-2.61E-01-1.98E-01
18 0.05469 0.00 0.00 0.00 0.00 0.00 1.03E 01 3.07E 00 1.06E-01-7.35E-01-7.66E-01-6.14E-01-4.66E-01-3.37E-01
17 0.05211 0.00 0.00 0.00 0.00 6.35E 00 1.01E 01 3.28E 00-1.84E-01-1.16E 00-1.13E 00-8.72E-01-6.40E-01-4.56E-01
16 0.04945 0.00 0.00 0.00 0.00 1.24E 01 1.06E 01 3.33E 00-5.48E-01-1.61E 00-1.48E 00-1.10E 00-7.98E-01-5.70E-01
15 0.04687 0.00 0.00 0.00 0.00 1.87E 01 1.09E 01 3.04E 00-1.01E 00-1.53E 00-1.72E 00-1.27E 00-9.23E-01-6.67E-01
14 0.04445 0.00 0.00 8.55E 00 1.77E 01 1.05E 01 2.42E 00-1.46E 00-2.22E 00-1.86E 00-1.37E 00-1.01E 00-7.44E-01
13 0.04211 0.00 0.00 1.53E 01 1.79E 01 9.91E 00 1.75E 00-1.77E 00-2.32E 00-1.91E 00-1.43E 00-1.08E 00-8.05E-01
12 0.03906 0.00 0.00 2.38E 01 1.83E 01 8.80E 00 7.73E-01-2.01E 00-2.30E 00-1.90E 00-1.46E 00-1.14E 00-8.69E-01
11 0.03578 0.00 1.08E 01 2.37E 01 1.80E 01 6.57E 00-1.76E-01-1.91E 00-2.09E 00-1.78E 00-1.43E 00-1.15E 00-9.05E-01
10 0.03328 0.00 1.78E 01 2.49E 01 1.73E 01 4.68E 00-5.85E-01-1.73E 00-1.89E 00-1.66E 00-1.38E 00-1.15E 00-9.16E-01
9 0.03125 0.00 2.42E 01 2.57E 01 1.62E 01 3.21E 00-7.57E-01-1.55E 00-1.70E 00-1.55E 00-1.33E 00-1.13E 00-9.14E-01
8 0.02859 0.00 2.35E 01 2.58E 01 1.43E 01 1.50E 00-8.71E-01-1.31E 00-1.46E 00-1.39E 00-1.25E 00-1.09E 00-9.01E-01
7 0.02437 0.00 2.32E 01 2.50E 01 1.00E 01-5.52E-01-8.72E-01-9.64E-01-1.09E 00-1.13E 00-1.10E 00-1.00E 00-8.49E-01
6 0.01906 0.00 2.35E 01 2.20E 01 2.55E 00-8.92E-01-7.52E-01-6.48E-01-7.19E-01-8.28E-01-8.73E-01-8.38E-01-7.29E-01
5 0.01344 0.00 2.35E 01 1.40E 01-1.74E 00-9.91E-01-6.00E-01-4.20E-01-4.38E-01-5.41E-01-6.16E-01-6.21E-01-5.50E-01
4 0.00812 0.00 2.09E 01 2.21E 00-8.47E-01-6.74E-01-3.96E-01-2.48E-01-2.42E-01-3.10E-01-3.70E-01-3.86E-01-3.46E-01
3 0.00359 0.00 1.15E 01-1.05E 00-4.35E-01-3.14E-01-1.82E-01-1.09E-01-1.03E-01-1.34E-01-1.63E-01-1.72E-01-1.56E-01
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1 0.00000 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 0.15786 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127
0 J Y
21 0.06250 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06062 -4.63E-02-2.58E-02-1.19E-02-4.53E-03-1.37E-03-5.70E-04 1.65E-04 4.79E-04 2.01E-03 3.49E-05 0.00
19 0.05766 -1.30E-01-7.31E-02-3.49E-02-1.36E-02-3.22E-03 9.00E-04 4.02E-03 5.57E-03 7.02E-03 3.92E-05 0.00
18 0.05469 -2.20E-01-1.27E-01-6.43E-02-2.85E-02-1.01E-02-1.60E-03 4.67E-03 7.97E-03 1.00E-02 3.92E-05 0.00
17 0.05211 -2.99E-01-1.76E-01-9.31E-02-4.48E-02-1.89E-02-6.12E-03 3.21E-03 8.22E-03 1.13E-02 4.83E-05 0.00
16 0.04945 -3.78E-01-2.27E-01-1.25E-01-6.39E-02-3.03E-02-1.27E-02 5.90E-06 6.94E-03 1.15E-02 6.76E-05 0.00
15 0.04687 -4.49E-01-2.76E-01-1.57E-01-8.40E-02-4.28E-02-2.04E-02-4.25E-03 4.65E-03 1.09E-02 9.26E-05 0.00
14 0.04445 -5.09E-01-3.19E-01-1.86E-01-1.03E-01-5.51E-02-2.83E-02-8.88E-03 1.91E-03 9.83E-03 1.17E-04 0.00
13 0.04211 -5.60E-01-3.57E-01-2.13E-01-1.21E-01-6.71E-02-3.60E-02-1.36E-02-1.06E-03 8.47E-03 1.38E-04 0.00
12 0.03906 -6.17E-01-4.02E-01-2.46E-01-1.44E-01-8.23E-02-4.61E-02-1.99E-02-5.12E-03 6.42E-03 1.53E-04 0.00
11 0.03578 -6.56E-01-4.37E-01-2.73E-01-1.64E-01-9.60E-02-5.53E-02-2.60E-02-9.23E-03 4.08E-03 1.45E-04 0.00
10 0.03328 -6.74E-01-4.55E-01-2.88E-01-1.76E-01-1.05E-01-6.12E-02-3.01E-02-1.20E-02 2.37E-03 1.22E-04 0.00
9 0.03125 -6.80E-01-4.64E-01-2.97E-01-1.83E-01-1.10E-01-6.50E-02-3.28E-02-1.40E-02 1.08E-03 9.66E-05 0.00
8 0.02859 -6.80E-01-4.70E-01-3.05E-01-1.90E-01-1.15E-01-6.91E-02-3.58E-02-1.62E-02-4.94E-04 6.01E-05 0.00
7 0.02437 -6.54E-01-4.61E-01-3.04E-01-1.92E-01-1.18E-01-7.17E-02-3.83E-02-1.85E-02-2.47E-03 1.25E-05 0.00
6 0.01906 -5.73E-01-4.12E-01-2.77E-01-1.78E-01-1.10E-01-6.74E-02-3.69E-02-1.86E-02-3.79E-03-1.85E-05 0.00
5 0.01344 -4.40E-01-3.21E-01-2.18E-01-1.42E-01-8.85E-02-5.43E-02-3.02E-02-1.56E-02-3.81E-03-2.33E-05 0.00
4 0.00812 -2.79E-01-2.05E-01-1.41E-01-9.20E-02-5.77E-02-3.55E-02-1.99E-02-1.04E-02-2.76E-03-1.35E-05 0.00
3 0.00359 -1.26E-01-9.30E-02-6.38E-02-4.19E-02-2.63E-02-1.62E-02-9.11E-03-4.79E-03-1.32E-03-4.40E-06 0.00
2 0.00000 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
1 0.00000 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
W VELOCITY

```


		X = 0.00000 0.00000 0.06295 0.12937 0.20308 0.28491 0.37574 0.47656 0.58847 0.71269 0.85058 1.00363												
0 J	Y													
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.49500	0.00	0.00	0.00	0.00	0.00	0.00	2.70E-01	4.74E-01	5.04E-01	4.75E-01	4.40E-01	4.11E-01	3.83E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	0.00	4.01E-01	5.47E-01	5.60E-01	5.23E-01	4.79E-01	4.38E-01	4.01E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	0.00	5.40E-01	6.26E-01	6.07E-01	5.52E-01	4.93E-01	4.41E-01	4.01E-01
17	0.42750	0.00	0.00	0.00	0.00	0.00	7.39E-01	6.51E-01	6.59E-01	6.12E-01	5.43E-01	4.78E-01	4.29E-01	3.92E-01
16	0.40625	0.00	0.00	0.00	0.00	0.00	6.45E-01	6.33E-01	6.16E-01	5.62E-01	4.97E-01	4.43E-01	4.05E-01	3.76E-01
15	0.38500	0.00	0.00	0.00	0.00	0.00	6.48E-01	6.15E-01	5.47E-01	4.78E-01	4.28E-01	3.96E-01	3.73E-01	3.54E-01
14	0.36500	0.00	0.00	0.00	9.51E-01	7.04E-01	5.66E-01	4.46E-01	3.80E-01	3.56E-01	3.47E-01	3.39E-01	3.29E-01	3.29E-01
13	0.34625	0.00	0.00	0.00	7.20E-01	6.12E-01	4.51E-01	3.26E-01	2.85E-01	2.89E-01	3.00E-01	3.05E-01	3.02E-01	3.02E-01
12	0.32750	0.00	0.00	0.00	6.35E-01	5.46E-01	3.43E-01	2.10E-01	1.97E-01	2.27E-01	2.54E-01	2.68E-01	2.74E-01	2.74E-01
11	0.29750	0.00	0.00	8.22E-01	6.42E-01	4.60E-01	1.58E-01	4.52E-02	8.01E-02	1.37E-01	1.80E-01	2.08E-01	2.24E-01	2.24E-01
10	0.27500	0.00	0.00	6.35E-01	5.72E-01	3.28E-01	1.57E-02	-4.20E-02	1.02E-02	7.56E-02	1.27E-01	1.61E-01	1.84E-01	1.84E-01
9	0.25750	0.00	0.00	6.46E-01	5.36E-01	2.19E-01	-6.96E-02	-9.38E-02	-3.63E-02	3.16E-02	8.58E-02	1.25E-01	1.53E-01	1.53E-01
8	0.24250	0.00	1.00E 00	7.25E-01	5.00E-01	1.23E-01	-1.24E-01	-1.30E-01	-7.16E-02	-4.02E-03	5.18E-02	9.38E-02	1.26E-01	1.26E-01
7	0.21500	0.00	1.00E 00	7.52E-01	4.32E-01	-2.05E-02	-1.92E-01	-1.80E-01	-1.27E-01	-6.41E-02	-7.99E-03	3.84E-02	7.72E-02	7.72E-02
6	0.17500	0.00	1.00E 00	7.32E-01	2.76E-01	-2.46E-01	-2.56E-01	-2.33E-01	-1.93E-01	-1.41E-01	-8.74E-02	-3.72E-02	9.55E-03	9.55E-03
5	0.13000	0.00	1.00E 00	6.18E-01	-7.95E-02	-3.21E-01	-3.08E-01	-2.82E-01	-2.51E-01	-2.11E-01	-1.63E-01	-1.10E-01	-5.67E-02	-5.67E-02
4	0.08500	0.00	1.00E 00	3.35E-01	-4.87E-01	-3.98E-01	-3.52E-01	-3.20E-01	-2.93E-01	-2.61E-01	-2.18E-01	-1.65E-01	-1.07E-01	-1.07E-01
3	0.04500	0.00	1.00E 00	-2.70E-01	-4.96E-01	-4.34E-01	-3.79E-01	-3.42E-01	-3.16E-01	-2.88E-01	-2.49E-01	-1.96E-01	-1.36E-01	-1.36E-01
2	0.01250	0.00	1.00E 00	-6.85E-01	-5.23E-01	-4.48E-01	-3.89E-01	-3.50E-01	-3.25E-01	-2.98E-01	-2.59E-01	-2.07E-01	-1.46E-01	-1.46E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299

0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	3.58E-01	3.39E-01	3.27E-01	3.21E-01	3.18E-01	3.18E-01	3.17E-01	3.17E-01	3.18E-01	3.19E-01	3.19E-01	3.19E-01
19	0.47500	3.72E-01	3.51E-01	3.38E-01	3.31E-01	3.28E-01	3.27E-01	3.28E-01	3.29E-01	3.32E-01	3.34E-01	3.34E-01	3.34E-01
18	0.44750	3.71E-01	3.50E-01	3.36E-01	3.27E-01	3.22E-01	3.19E-01	3.18E-01	3.19E-01	3.20E-01	3.21E-01	3.21E-01	3.21E-01
17	0.42750	3.65E-01	3.44E-01	3.30E-01	3.21E-01	3.15E-01	3.11E-01	3.09E-01	3.08E-01	3.08E-01	3.08E-01	3.08E-01	3.08E-01
16	0.40625	3.53E-01	3.35E-01	3.21E-01	3.12E-01	3.05E-01	3.01E-01	2.98E-01	2.96E-01	2.95E-01	2.95E-01	2.95E-01	2.95E-01
15	0.38500	3.36E-01	3.21E-01	3.09E-01	3.00E-01	2.94E-01	2.89E-01	2.85E-01	2.83E-01	2.82E-01	2.81E-01	2.81E-01	2.81E-01
14	0.36500	3.17E-01	3.06E-01	2.96E-01	2.88E-01	2.82E-01	2.77E-01	2.73E-01	2.71E-01	2.69E-01	2.68E-01	2.68E-01	2.68E-01
13	0.34625	2.96E-01	2.89E-01	2.82E-01	2.75E-01	2.69E-01	2.65E-01	2.61E-01	2.59E-01	2.57E-01	2.56E-01	2.56E-01	2.56E-01
12	0.32750	2.73E-01	2.70E-01	2.66E-01	2.61E-01	2.56E-01	2.52E-01	2.49E-01	2.47E-01	2.45E-01	2.44E-01	2.44E-01	2.44E-01
11	0.29750	2.33E-01	2.36E-01	2.37E-01	2.36E-01	2.34E-01	2.32E-01	2.30E-01	2.28E-01	2.26E-01	2.25E-01	2.25E-01	2.25E-01
10	0.27500	2.00E-01	2.09E-01	2.14E-01	2.16E-01	2.16E-01	2.16E-01	2.15E-01	2.14E-01	2.13E-01	2.12E-01	2.11E-01	2.11E-01
9	0.25750	1.74E-01	1.88E-01	1.96E-01	2.01E-01	2.03E-01	2.03E-01	2.03E-01	2.03E-01	2.02E-01	2.01E-01	2.01E-01	2.01E-01
8	0.24250	1.51E-01	1.69E-01	1.80E-01	1.87E-01	1.91E-01	1.93E-01	1.94E-01	1.94E-01	1.94E-01	1.93E-01	1.93E-01	1.93E-01
7	0.21500	1.09E-01	1.34E-01	1.51E-01	1.63E-01	1.70E-01	1.74E-01	1.77E-01	1.78E-01	1.78E-01	1.78E-01	1.78E-01	1.78E-01
6	0.17500	5.12E-02	8.53E-02	1.11E-01	1.29E-01	1.41E-01	1.49E-01	1.54E-01	1.57E-01	1.58E-01	1.58E-01	1.58E-01	1.58E-01
5	0.13000	-6.42E-03	3.67E-02	7.05E-02	9.53E-02	1.13E-01	1.25E-01	1.33E-01	1.37E-01	1.39E-01	1.40E-01	1.40E-01	1.40E-01
4	0.08500	-5.07E-02	-7.92E-04	3.94E-02	6.96E-02	9.13E-02	1.06E-01	1.17E-01	1.22E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01
3	0.04500	-7.58E-02	-2.20E-02	2.18E-02	5.51E-02	7.92E-02	9.60E-02	1.08E-01	1.14E-01	1.18E-01	1.19E-01	1.19E-01	1.19E-01
2	0.01250	-8.49E-02	-2.97E-02	1.54E-02	4.98E-02	7.48E-02	9.23E-02	1.04E-01	1.11E-01	1.15E-01	1.16E-01	1.16E-01	1.16E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		DIMENSIONLESS V VELOCITY											
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415

0 J	Y												
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	0.00	0.00	0.00	0.00	5.03E-02	3.41E-02	4.46E-03	-3.90E-03	-4.25E-03	-3.25E-03	-2.75E-03	-2.26E-03
19	0.46125	0.00	0.00	0.00	0.00	1.72E-01	7.52E-02	7.68E-03	-1.20E-02	-1.31E-02	-1.08E-02	-8.70E-03	-6.60E-03

5	2.419E-01	3.436E-03
6	3.280E-01	3.773E-03
7	4.235E-01	3.765E-03
8	5.296E-01	3.520E-03
9	6.473E-01	3.351E-03
10	7.780E-01	3.506E-03
11	9.231E-01	3.949E-03
12	1.084E 00	4.354E-03
13	1.263E 00	4.576E-03
14	1.461E 00	4.624E-03
15	1.682E 00	4.547E-03
16	1.926E 00	4.398E-03
17	2.197E 00	4.213E-03
18	2.499E 00	4.012E-03
19	2.833E 00	3.813E-03
20	3.167E 00	3.629E-03
21	3.502E 00	3.463E-03
22	3.836E 00	3.410E-03

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1X-AXIS IS XI

Y-AXES ARE

SYMBOL

MAXIMUM VALUES 0.376E 00 0.405E 00 0.429E 00 0.452E 00 0.475E 00 0.500E 00

RADIAL POSITION R/D

	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0	0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18	0.20
X	0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18	0.20
X	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.22
X	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24
X	0.06	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26
X	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.28
X	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.30
X	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.30	0.32
X	0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.30	0.32	0.34

158	0.3387E-01	0.1802E-01	0.1680E-01	0.7271E-02	0.3622E-02	0.1214E	09	0.5312E	01	0.3671E-02	0.1655E	02	0.1820E	04	0.2497E	04
159	0.3306E-01	0.1795E-01	0.1687E-01	0.7341E-02	0.3571E-02	0.1218E	09	0.5318E	01	0.3577E-02	0.1655E	02	0.1821E	04	0.2497E	04
160	0.3225E-01	0.1785E-01	0.1693E-01	0.7392E-02	0.3523E-02	0.1217E	09	0.5323E	01	0.3477E-02	0.1656E	02	0.1822E	04	0.2498E	04
161	0.3145E-01	0.1775E-01	0.1699E-01	0.7434E-02	0.3476E-02	0.1210E	09	0.5329E	01	0.3372E-02	0.1656E	02	0.1822E	04	0.2498E	04
162	0.3065E-01	0.1767E-01	0.1705E-01	0.7502E-02	0.3431E-02	0.1206E	09	0.5334E	01	0.3262E-02	0.1657E	02	0.1823E	04	0.2499E	04
163	0.2987E-01	0.1757E-01	0.1709E-01	0.7570E-02	0.3390E-02	0.1201E	09	0.5339E	01	0.3147E-02	0.1657E	02	0.1824E	04	0.2499E	04
164	0.2910E-01	0.1747E-01	0.1713E-01	0.7597E-02	0.3359E-02	0.1190E	09	0.5344E	01	0.3029E-02	0.1658E	02	0.1824E	04	0.2500E	04
165	0.2833E-01	0.1736E-01	0.1716E-01	0.7641E-02	0.3334E-02	0.1187E	09	0.5349E	01	0.2909E-02	0.1659E	02	0.1825E	04	0.2500E	04
166	0.2760E-01	0.1724E-01	0.1719E-01	0.7666E-02	0.3308E-02	0.1177E	09	0.5354E	01	0.2785E-02	0.1659E	02	0.1826E	04	0.2501E	04
167	0.2687E-01	0.1713E-01	0.1721E-01	0.7710E-02	0.3286E-02	0.1171E	09	0.5359E	01	0.2660E-02	0.1660E	02	0.1826E	04	0.2501E	04
168	0.2616E-01	0.1703E-01	0.1722E-01	0.7757E-02	0.3264E-02	0.1163E	09	0.5363E	01	0.2534E-02	0.1660E	02	0.1827E	04	0.2502E	04
169	0.2547E-01	0.1692E-01	0.1722E-01	0.7767E-02	0.3240E-02	0.1153E	09	0.5368E	01	0.2407E-02	0.1661E	02	0.1828E	04	0.2502E	04
170	0.2480E-01	0.1683E-01	0.1722E-01	0.7805E-02	0.3216E-02	0.1143E	09	0.5372E	01	0.2281E-02	0.1661E	02	0.1828E	04	0.2503E	04
171	0.2416E-01	0.1675E-01	0.1721E-01	0.7850E-02	0.3191E-02	0.1136E	09	0.5376E	01	0.2155E-02	0.1662E	02	0.1829E	04	0.2503E	04
172	0.2353E-01	0.1666E-01	0.1719E-01	0.7858E-02	0.3165E-02	0.1127E	09	0.5380E	01	0.2029E-02	0.1662E	02	0.1830E	04	0.2504E	04
173	0.2292E-01	0.1657E-01	0.1717E-01	0.7896E-02	0.3137E-02	0.1113E	09	0.5384E	01	0.1906E-02	0.1663E	02	0.1830E	04	0.2504E	04
174	0.2234E-01	0.1648E-01	0.1713E-01	0.7906E-02	0.3110E-02	0.1107E	09	0.5387E	01	0.1783E-02	0.1663E	02	0.1831E	04	0.2505E	04
175	0.2177E-01	0.1640E-01	0.1710E-01	0.7922E-02	0.3079E-02	0.1098E	09	0.5390E	01	0.1663E-02	0.1664E	02	0.1832E	04	0.2505E	04
176	0.2123E-01	0.1633E-01	0.1705E-01	0.7960E-02	0.3050E-02	0.1089E	09	0.5394E	01	0.1546E-02	0.1664E	02	0.1832E	04	0.2506E	04
177	0.2071E-01	0.1629E-01	0.1700E-01	0.7945E-02	0.3017E-02	0.1078E	09	0.5397E	01	0.1431E-02	0.1665E	02	0.1833E	04	0.2506E	04
178	0.2021E-01	0.1626E-01	0.1694E-01	0.7958E-02	0.2985E-02	0.1068E	09	0.5399E	01	0.1319E-02	0.1666E	02	0.1833E	04	0.2507E	04
179	0.1972E-01	0.1625E-01	0.1688E-01	0.7973E-02	0.2953E-02	0.1058E	09	0.5402E	01	0.1211E-02	0.1666E	02	0.1834E	04	0.2508E	04
180	0.1927E-01	0.1624E-01	0.1681E-01	0.7977E-02	0.2920E-02	0.1049E	09	0.5405E	01	0.1107E-02	0.1667E	02	0.1835E	04	0.2508E	04
181	0.1882E-01	0.1622E-01	0.1674E-01	0.7957E-02	0.2886E-02	0.1040E	09	0.5407E	01	0.1007E-02	0.1667E	02	0.1835E	04	0.2509E	04
182	0.1841E-01	0.1620E-01	0.1665E-01	0.7951E-02	0.2850E-02	0.1027E	09	0.5409E	01	0.9101E-03	0.1668E	02	0.1836E	04	0.2509E	04
183	0.1801E-01	0.1618E-01	0.1657E-01	0.7951E-02	0.2816E-02	0.1019E	09	0.5411E	01	0.8184E-03	0.1668E	02	0.1836E	04	0.2510E	04
184	0.1763E-01	0.1617E-01	0.1648E-01	0.7965E-02	0.2780E-02	0.1010E	09	0.5413E	01	0.7306E-03	0.1669E	02	0.1837E	04	0.2510E	04
185	0.1725E-01	0.1616E-01	0.1639E-01	0.7915E-02	0.2744E-02	0.9985E	08	0.5415E	01	0.6471E-03	0.1670E	02	0.1837E	04	0.2511E	04
186	0.1691E-01	0.1614E-01	0.1629E-01	0.7911E-02	0.2709E-02	0.9903E	08	0.5416E	01	0.5679E-03	0.1670E	02	0.1838E	04	0.2512E	04
187	0.1658E-01	0.1612E-01	0.1618E-01	0.7890E-02	0.2672E-02	0.9784E	08	0.5418E	01	0.4936E-03	0.1671E	02	0.1839E	04	0.2512E	04
188	0.1628E-01	0.1611E-01	0.1608E-01	0.7871E-02	0.2635E-02	0.9674E	08	0.5419E	01	0.4245E-03	0.1671E	02	0.1839E	04	0.2513E	04
189	0.1598E-01	0.1606E-01	0.1597E-01	0.7805E-02	0.2601E-02	0.9580E	08	0.5420E	01	0.3591E-03	0.1672E	02	0.1840E	04	0.2513E	04
190	0.1571E-01	0.1604E-01	0.1586E-01	0.7824E-02	0.2565E-02	0.9508E	08	0.5421E	01	0.2993E-03	0.1673E	02	0.1840E	04	0.2514E	04
191	0.1543E-01	0.1598E-01	0.1574E-01	0.7775E-02	0.2530E-02	0.9402E	08	0.5422E	01	0.2430E-03	0.1673E	02	0.1841E	04	0.2515E	04
192	0.1519E-01	0.1592E-01	0.1562E-01	0.7765E-02	0.2496E-02	0.9307E	08	0.5423E	01	0.1916E-03	0.1674E	02	0.1841E	04	0.2515E	04
193	0.1495E-01	0.1584E-01	0.1550E-01	0.7729E-02	0.2461E-02	0.9232E	08	0.5424E	01	0.1445E-03	0.1675E	02	0.1842E	04	0.2516E	04
194	0.1474E-01	0.1576E-01	0.1538E-01	0.7674E-02	0.2427E-02	0.9122E	08	0.5425E	01	0.1016E-03	0.1675E	02	0.1842E	04	0.2516E	04
195	0.1453E-01	0.1568E-01	0.1526E-01	0.7644E-02	0.2392E-02	0.9009E	08	0.5425E	01	0.6318E-04	0.1676E	02	0.1843E	04	0.2517E	04
196	0.1434E-01	0.1559E-01	0.1513E-01	0.7609E-02	0.2359E-02	0.8953E	08	0.5426E	01	0.2843E-04	0.1676E	02	0.1843E	04	0.2518E	04
197	0.1418E-01	0.1548E-01	0.1501E-01	0.7562E-02	0.2325E-02	0.8839E	08	0.5426E	01	0.2251E-05	0.1677E	02	0.1844E	04	0.2518E	04
198	0.1401E-01	0.1539E-01	0.1488E-01	0.7521E-02	0.2291E-02	0.8758E	08	0.5427E	01	0.2939E-04	0.1678E	02	0.1844E	04	0.2519E	04
199	0.1387E-01	0.1527E-01	0.1476E-01	0.7496E-02	0.2257E-02	0.8687E	08	0.5427E	01	0.5286E-04	0.1678E	02	0.1845E	04	0.2519E	04
200	0.1373E-01	0.1516E-01	0.1463E-01	0.7454E-02	0.2224E-02	0.8559E	08	0.5428E	01	0.7349E-04	0.1679E	02	0.1845E	04	0.2520E	04

0- - - - -

SWIRL CASE WITH LFS = 6
AND NSBR = 0

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 1.750

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 68.000

COMPUTED INLET SWIRL NUMBER = 1.6528

DIMENSIONLESS LENGTH SCALE													
0	1	2	3	4	5	6	7	8	9	10	11	12	13
4	0.08500	3.51E-02	3.10E-02	2.61E-02	2.15E-02	1.75E-02	1.42E-02	1.15E-02	9.50E-03	8.00E-03	7.71E-03	3.00E-02	
3	0.04500	3.43E-02	3.03E-02	2.57E-02	2.12E-02	1.73E-02	1.40E-02	1.14E-02	9.46E-03	7.96E-03	7.57E-03	3.00E-02	
2	0.01250	3.41E-02	3.02E-02	2.56E-02	2.12E-02	1.73E-02	1.40E-02	1.14E-02	9.48E-03	7.99E-03	7.57E-03	3.00E-02	
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	I =	2	3	4	5	6	7	8	9	10	11	12	13
0	X =	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552	0.15786
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	2.01E-01	1.93E-01	1.84E-01	1.75E-01	1.74E-01	2.18E-01	2.92E-01	3.23E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	1.82E-01	1.82E-01	1.87E-01	1.93E-01	2.27E-01	3.58E-01	4.95E-01	5.55E-01
17	0.05344	0.00	0.00	5.10E-02	1.16E-01	1.32E-01	1.51E-01	1.70E-01	1.93E-01	2.79E-01	4.48E-01	5.85E-01	6.56E-01
16	0.05078	0.00	0.00	1.78E-01	1.45E-01	1.38E-01	1.45E-01	1.62E-01	2.12E-01	3.58E-01	5.24E-01	6.51E-01	7.27E-01
15	0.04812	0.00	0.00	1.78E-01	1.22E-01	1.20E-01	1.32E-01	1.64E-01	2.74E-01	4.39E-01	5.84E-01	6.99E-01	7.79E-01
14	0.04562	0.00	5.10E-02	8.78E-02	9.24E-02	1.08E-01	1.33E-01	2.04E-01	3.55E-01	5.03E-01	6.29E-01	7.36E-01	8.16E-01
13	0.04328	0.00	1.60E-01	9.77E-02	8.99E-02	1.14E-01	1.60E-01	2.76E-01	4.23E-01	5.52E-01	6.65E-01	7.66E-01	8.47E-01
12	0.04094	0.00	1.60E-01	7.46E-02	8.29E-02	1.24E-01	2.06E-01	3.46E-01	4.79E-01	5.94E-01	6.99E-01	7.95E-01	8.75E-01
11	0.03719	7.64E-02	6.38E-02	4.93E-02	8.15E-02	1.52E-01	2.99E-01	4.42E-01	5.53E-01	6.54E-01	7.49E-01	8.39E-01	9.17E-01
10	0.03437	1.60E-01	5.82E-02	4.11E-02	9.17E-02	2.10E-01	3.70E-01	4.97E-01	5.99E-01	6.94E-01	7.85E-01	8.71E-01	9.47E-01
9	0.03219	1.60E-01	3.08E-02	3.32E-02	1.07E-01	2.52E-01	4.21E-01	5.37E-01	6.34E-01	7.25E-01	8.12E-01	8.96E-01	9.70E-01
8	0.03031	5.29E-03	7.13E-03	3.19E-02	1.26E-01	2.95E-01	4.63E-01	5.70E-01	6.63E-01	7.51E-01	8.36E-01	9.17E-01	9.90E-01
7	0.02687	5.29E-03	7.93E-03	4.26E-02	1.61E-01	3.92E-01	5.39E-01	6.33E-01	7.17E-01	7.98E-01	8.78E-01	9.56E-01	1.03E 00
6	0.02187	5.29E-03	1.05E-02	6.71E-02	2.51E-01	5.20E-01	6.40E-01	7.20E-01	7.93E-01	8.66E-01	9.39E-01	1.01E 00	1.08E 00
5	0.01625	5.32E-03	1.91E-02	1.23E-01	3.96E-01	6.51E-01	7.44E-01	8.10E-01	8.74E-01	9.39E-01	1.01E 00	1.07E 00	1.14E 00
4	0.01062	5.44E-03	4.62E-02	3.88E-01	5.67E-01	7.62E-01	8.35E-01	8.91E-01	9.48E-01	1.01E 00	1.07E 00	1.13E 00	1.19E 00
3	0.00562	6.03E-03	1.29E-01	4.70E-01	6.97E-01	8.39E-01	9.00E-01	9.52E-01	1.00E 00	1.06E 00	1.11E 00	1.17E 00	1.23E 00
2	0.00156	1.08E-02	3.14E-01	6.07E-01	7.83E-01	8.93E-01	9.47E-01	9.97E-01	1.05E 00	1.10E 00	1.16E 00	1.21E 00	1.26E 00
0	I =	14	15	16	17	18	19	20	21	22	23		
0	X =	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127		
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	5.00E-03	
19	0.05937	3.22E-01	3.06E-01	2.81E-01	2.52E-01	2.22E-01	1.93E-01	1.70E-01	1.51E-01	1.53E-01	5.00E-03		
18	0.05594	5.62E-01	5.45E-01	5.15E-01	4.77E-01	4.36E-01	3.96E-01	3.60E-01	3.30E-01	3.36E-01	5.00E-03		
17	0.05344	6.75E-01	6.65E-01	6.40E-01	6.05E-01	5.66E-01	5.26E-01	4.91E-01	4.60E-01	4.67E-01	5.00E-03		
16	0.05078	7.59E-01	7.60E-01	7.42E-01	7.14E-01	6.79E-01	6.43E-01	6.11E-01	5.83E-01	5.88E-01	5.00E-03		
15	0.04812	8.20E-01	8.31E-01	8.22E-01	8.01E-01	7.72E-01	7.41E-01	7.13E-01	6.88E-01	6.91E-01	5.00E-03		
14	0.04562	8.65E-01	8.84E-01	8.82E-01	8.67E-01	8.44E-01	8.18E-01	7.94E-01	7.73E-01	7.73E-01	5.00E-03		
13	0.04328	9.00E-01	9.25E-01	9.29E-01	9.19E-01	9.01E-01	8.80E-01	8.59E-01	8.41E-01	8.38E-01	5.00E-03		
12	0.04094	9.30E-01	9.60E-01	9.69E-01	9.64E-01	9.50E-01	9.33E-01	9.16E-01	9.00E-01	8.96E-01	5.00E-03		
11	0.03719	9.74E-01	1.01E 00	1.02E 00	1.03E 00	1.02E 00	1.00E 00	9.92E-01	9.79E-01	9.74E-01	5.00E-03		
10	0.03437	1.00E 00	1.04E 00	1.06E 00	1.06E 00	1.06E 00	1.05E 00	1.04E 00	1.03E 00	1.02E 00	5.00E-03		
9	0.03219	1.03E 00	1.07E 00	1.09E 00	1.09E 00	1.09E 00	1.08E 00	1.07E 00	1.07E 00	1.06E 00	5.00E-03		
8	0.03031	1.05E 00	1.09E 00	1.11E 00	1.12E 00	1.11E 00	1.11E 00	1.10E 00	1.09E 00	1.09E 00	5.00E-03		
7	0.02687	1.08E 00	1.12E 00	1.14E 00	1.15E 00	1.16E 00	1.15E 00	1.15E 00	1.14E 00	1.14E 00	5.00E-03		
6	0.02187	1.13E 00	1.17E 00	1.19E 00	1.20E 00	1.21E 00	1.21E 00	1.20E 00	1.20E 00	1.20E 00	5.00E-03		
5	0.01625	1.19E 00	1.22E 00	1.25E 00	1.26E 00	1.26E 00	1.26E 00	1.26E 00	1.25E 00	1.26E 00	5.00E-03		
4	0.01062	1.24E 00	1.27E 00	1.29E 00	1.30E 00	1.30E 00	1.30E 00	1.30E 00	1.29E 00	1.31E 00	5.00E-03		
3	0.00562	1.27E 00	1.31E 00	1.32E 00	1.33E 00	1.33E 00	1.32E 00	1.32E 00	1.32E 00	1.34E 00	5.00E-03		
2	0.00156	1.30E 00	1.33E 00	1.34E 00	1.35E 00	1.34E 00	1.34E 00	1.34E 00	1.33E 00	1.35E 00	5.00E-03		
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
DIMENSIONLESS EFF. VISCOSITY													

48	0.1889E	00	0.1148E	00	0.1000E	00	0.3598E-01	0.2885E-01	0.4771E	09	0.6490E	01-0.5407E-03	0.1129E	02	0.1274E	04	0.9761E	03
49	0.1854E	00	0.1123E	00	0.9965E-01	0.3652E-01	0.2880E-01	0.4397E	09	0.6490E	01-0.6715E-03	0.1130E	02	0.1274E	04	0.9774E	03	
50	0.1822E	00	0.1101E	00	0.9918E-01	0.3718E-01	0.2869E-01	0.4042E	09	0.6489E	01-0.8113E-03	0.1131E	02	0.1274E	04	0.9788E	03	
51	0.1791E	00	0.1083E	00	0.9859E-01	0.3777E-01	0.2852E-01	0.3767E	09	0.6489E	01-0.9596E-03	0.1131E	02	0.1274E	04	0.9803E	03	
52	0.1760E	00	0.1064E	00	0.9795E-01	0.3839E-01	0.2832E-01	0.3521E	09	0.6488E	01-0.1116E-02	0.1132E	02	0.1274E	04	0.9819E	03	
53	0.1725E	00	0.1052E	00	0.9737E-01	0.3904E-01	0.2804E-01	0.3300E	09	0.6487E	01-0.1281E-02	0.1133E	02	0.1274E	04	0.9836E	03	
54	0.1693E	00	0.1038E	00	0.9672E-01	0.3969E-01	0.2770E-01	0.3073E	09	0.6486E	01-0.1455E-02	0.1133E	02	0.1274E	04	0.9855E	03	
55	0.1663E	00	0.1023E	00	0.9627E-01	0.4035E-01	0.2731E-01	0.2847E	09	0.6485E	01-0.1637E-02	0.1134E	02	0.1274E	04	0.9874E	03	
56	0.1634E	00	0.1010E	00	0.9578E-01	0.4106E-01	0.2687E-01	0.2622E	09	0.6483E	01-0.1828E-02	0.1135E	02	0.1274E	04	0.9895E	03	
57	0.1609E	00	0.9984E-01	0.9514E-01	0.4172E-01	0.2638E-01	0.2404E	09	0.6481E	01-0.2026E-02	0.1136E	02	0.1274E	04	0.9918E	03		
58	0.1584E	00	0.9860E-01	0.9436E-01	0.4228E-01	0.2586E-01	0.2196E	09	0.6479E	01-0.2232E-02	0.1136E	02	0.1274E	04	0.9942E	03		
59	0.1556E	00	0.9768E-01	0.9347E-01	0.4283E-01	0.2531E-01	0.2025E	09	0.6477E	01-0.2446E-02	0.1137E	02	0.1274E	04	0.9967E	03		
60	0.1529E	00	0.9706E-01	0.9271E-01	0.4334E-01	0.2475E-01	0.1870E	09	0.6474E	01-0.2667E-02	0.1138E	02	0.1274E	04	0.9994E	03		
61	0.1501E	00	0.9657E-01	0.9188E-01	0.4384E-01	0.2420E-01	0.1774E	09	0.6471E	01-0.2894E-02	0.1139E	02	0.1274E	04	0.1002E	04		
62	0.1477E	00	0.9595E-01	0.9127E-01	0.4430E-01	0.2365E-01	0.1675E	09	0.6467E	01-0.3127E-02	0.1140E	02	0.1274E	04	0.1005E	04		
63	0.1457E	00	0.9515E-01	0.9059E-01	0.4471E-01	0.2311E-01	0.1579E	09	0.6464E	01-0.3366E-02	0.1141E	02	0.1274E	04	0.1009E	04		
64	0.1434E	00	0.9451E-01	0.8975E-01	0.4507E-01	0.2256E-01	0.1480E	09	0.6459E	01-0.3609E-02	0.1142E	02	0.1274E	04	0.1012E	04		
65	0.1411E	00	0.9396E-01	0.8877E-01	0.4541E-01	0.2201E-01	0.1384E	09	0.6455E	01-0.3857E-02	0.1143E	02	0.1275E	04	0.1015E	04		
66	0.1389E	00	0.9345E-01	0.8763E-01	0.4574E-01	0.2145E-01	0.1301E	09	0.6450E	01-0.4107E-02	0.1144E	02	0.1275E	04	0.1019E	04		
67	0.1366E	00	0.9303E-01	0.8641E-01	0.4593E-01	0.2090E-01	0.1223E	09	0.6445E	01-0.4361E-02	0.1145E	02	0.1275E	04	0.1023E	04		
68	0.1343E	00	0.9271E-01	0.8515E-01	0.4610E-01	0.2035E-01	0.1151E	09	0.6439E	01-0.4615E-02	0.1146E	02	0.1275E	04	0.1027E	04		
69	0.1326E	00	0.9236E-01	0.8396E-01	0.4628E-01	0.1980E-01	0.1085E	09	0.6434E	01-0.4869E-02	0.1147E	02	0.1276E	04	0.1031E	04		
70	0.1311E	00	0.9194E-01	0.8297E-01	0.4627E-01	0.1925E-01	0.1022E	09	0.6427E	01-0.5123E-02	0.1149E	02	0.1276E	04	0.1036E	04		
71	0.1293E	00	0.9148E-01	0.8187E-01	0.4631E-01	0.1871E-01	0.9568E	08	0.6421E	01-0.5374E-02	0.1150E	02	0.1276E	04	0.1040E	04		
72	0.1273E	00	0.9093E-01	0.8067E-01	0.4624E-01	0.1817E-01	0.9016E	08	0.6414E	01-0.5621E-02	0.1151E	02	0.1276E	04	0.1045E	04		
73	0.1253E	00	0.9023E-01	0.7935E-01	0.4612E-01	0.1764E-01	0.8659E	08	0.6406E	01-0.5864E-02	0.1153E	02	0.1277E	04	0.1050E	04		
74	0.1234E	00	0.8952E-01	0.7791E-01	0.4590E-01	0.1711E-01	0.8291E	08	0.6398E	01-0.6100E-02	0.1154E	02	0.1277E	04	0.1055E	04		
75	0.1216E	00	0.8897E-01	0.7643E-01	0.4568E-01	0.1658E-01	0.7951E	08	0.6390E	01-0.6330E-02	0.1156E	02	0.1277E	04	0.1061E	04		
76	0.1200E	00	0.8854E-01	0.7484E-01	0.4535E-01	0.1607E-01	0.7591E	08	0.6382E	01-0.6549E-02	0.1158E	02	0.1278E	04	0.1066E	04		
77	0.1184E	00	0.8806E-01	0.7320E-01	0.4498E-01	0.1556E-01	0.7230E	08	0.6373E	01-0.6759E-02	0.1159E	02	0.1278E	04	0.1072E	04		
78	0.1168E	00	0.8738E-01	0.7166E-01	0.4454E-01	0.1505E-01	0.6874E	08	0.6364E	01-0.6956E-02	0.1161E	02	0.1279E	04	0.1077E	04		
79	0.1152E	00	0.8654E-01	0.7020E-01	0.4406E-01	0.1456E-01	0.6524E	08	0.6354E	01-0.7140E-02	0.1163E	02	0.1279E	04	0.1083E	04		
80	0.1133E	00	0.8557E-01	0.6871E-01	0.4352E-01	0.1407E-01	0.6151E	08	0.6344E	01-0.7308E-02	0.1164E	02	0.1279E	04	0.1089E	04		
81	0.1112E	00	0.8453E-01	0.6713E-01	0.4287E-01	0.1360E-01	0.5825E	08	0.6334E	01-0.7461E-02	0.1166E	02	0.1280E	04	0.1095E	04		
82	0.1097E	00	0.8335E-01	0.6548E-01	0.4225E-01	0.1313E-01	0.5486E	08	0.6323E	01-0.7596E-02	0.1168E	02	0.1280E	04	0.1102E	04		
83	0.1083E	00	0.8206E-01	0.6385E-01	0.4156E-01	0.1267E-01	0.5175E	08	0.6313E	01-0.7712E-02	0.1170E	02	0.1281E	04	0.1108E	04		
84	0.1068E	00	0.8076E-01	0.6219E-01	0.4079E-01	0.1223E-01	0.4882E	08	0.6302E	01-0.7810E-02	0.1172E	02	0.1281E	04	0.1114E	04		
85	0.1051E	00	0.7945E-01	0.6050E-01	0.4005E-01	0.1180E-01	0.4602E	08	0.6291E	01-0.7885E-02	0.1174E	02	0.1282E	04	0.1121E	04		
86	0.1034E	00	0.7837E-01	0.5879E-01	0.3921E-01	0.1139E-01	0.4371E	08	0.6279E	01-0.7940E-02	0.1176E	02	0.1282E	04	0.1127E	04		
87	0.1017E	00	0.7729E-01	0.5711E-01	0.3833E-01	0.1099E-01	0.4144E	08	0.6268E	01-0.7972E-02	0.1178E	02	0.1283E	04	0.1134E	04		
88	0.9998E-01	0.7603E-01	0.5548E-01	0.3749E-01	0.1061E-01	0.3968E	08	0.6256E	01-0.7982E-02	0.1180E	02	0.1283E	04	0.1140E	04			
89	0.9831E-01	0.7471E-01	0.5391E-01	0.3689E-01	0.1021E-01	0.3848E	08	0.6242E	01-0.9130E-02	0.1183E	02	0.1284E	04	0.1147E	04			
90	0.9346E-01	0.8207E-01	0.5225E-01	0.3592E-01	0.9872E-02	0.3735E	08	0.6228E	01-0.9396E-02	0.1185E	02	0.1284E	04	0.1154E	04			
91	0.9308E-01	0.7857E-01	0.5055E-01	0.3481E-01	0.9566E-02	0.3611E	08	0.6215E	01-0.8264E-02	0.1187E	02	0.1284E	04	0.1161E	04			
92	0.9412E-01	0.6946E-01	0.4903E-01	0.3416E-01	0.9145E-02	0.3275E	08	0.6201E	01-0.8996E-02	0.1189E	02	0.1285E	04	0.1168E	04			
93	0.8830E-01	0.7646E-01	0.4744E-01	0.3288E-01	0.8745E-02	0.3035E	08	0.6187E	01-0.9052E-02	0.1192E	02	0.1286E	04	0.1175E	04			
94	0.8811E-01	0.7240E-01	0.4580E-01	0.3144E-01	0.8383E-02	0.2961E	08	0.6172E	01-0.8997E-02	0.1194E	02	0.1286E	04	0.1181E	04			
95	0.8564E-01	0.7106E-01	0.4416E-01	0.3048E-01	0.8083E-02	0.2977E	08	0.6158E	01-0.8801E-02	0.1196E	02	0.1287E	04	0.1188E	04			
96	0.8400E-01	0.6873E-01	0.4255E-01	0.2942E-01	0.7826E-02	0.2938E	08	0.6144E	01-0.8572E-02	0.1199E	02	0.1287E	04	0.1194E	04			
97	0.8238E-01	0.6676E-01	0.4100E-01	0.2845E-01	0.7591E-02	0.2970E	08	0.6130E	01-0.8301E-02	0.1201E	02	0.1288E	04	0.1200E	04			
98	0.8085E-01	0.6488E-01	0.3950E-01	0.2745E-01	0.7370E-02	0.3004E	08	0.6116E	01-0.8006E-02	0.1203E	02	0.1289E	04	0.1206E	04			
99	0.7920E-01	0.6296E-01	0.3810E-01	0.2650E-01	0.7159E-02	0.3066E	08	0.6102E	01-0.7685E-02	0.1206E	02	0.1289E	04	0.1212E	04			
100	0.7749E-01	0.6093E-01	0.3673E-01	0.2560E-01	0.6943E-02	0.3092E	08	0.6089E	01-0.7343E-02	0.1208E	02	0.1290E	04	0.1218E	04			
101	0.7578E-01	0.5883E-01	0.3539E-01	0.2465E-01	0.6736E-02	0.3127E	08	0.6076E	01-0.6982E-02	0.1210E	02	0.1290E	04	0.1224E	04			

	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299	
0 J	Y												
11	1.00000	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	
10	0.90000	4.82E-01	4.81E-01	4.80E-01	4.79E-01	4.79E-01	4.79E-01	4.78E-01	4.78E-01	4.78E-01	4.79E-01	4.79E-01	
9	0.80000	4.64E-01	4.61E-01	4.59E-01	4.58E-01	4.57E-01	4.57E-01	4.56E-01	4.56E-01	4.56E-01	4.57E-01	4.57E-01	
8	0.70000	4.46E-01	4.42E-01	4.38E-01	4.36E-01	4.34E-01	4.34E-01	4.33E-01	4.33E-01	4.33E-01	4.34E-01	4.34E-01	
7	0.60000	4.26E-01	4.20E-01	4.15E-01	4.12E-01	4.10E-01	4.09E-01	4.08E-01	4.08E-01	4.08E-01	4.08E-01	4.08E-01	
6	0.50000	4.05E-01	3.97E-01	3.91E-01	3.86E-01	3.83E-01	3.81E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01	
5	0.40000	3.81E-01	3.71E-01	3.63E-01	3.57E-01	3.53E-01	3.50E-01	3.48E-01	3.48E-01	3.48E-01	3.48E-01	3.48E-01	
4	0.30000	3.53E-01	3.41E-01	3.31E-01	3.23E-01	3.17E-01	3.13E-01	3.11E-01	3.09E-01	3.09E-01	3.09E-01	3.09E-01	
3	0.20000	3.20E-01	3.04E-01	2.90E-01	2.80E-01	2.73E-01	2.68E-01	2.64E-01	2.62E-01	2.61E-01	2.61E-01	2.61E-01	
2	0.10000	2.74E-01	2.51E-01	2.32E-01	2.18E-01	2.08E-01	2.01E-01	1.96E-01	1.94E-01	1.92E-01	1.92E-01	1.92E-01	
1	0.00000	1.56E-01	4.57E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	-*-*-*-*-*	
	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	5.04E 05	5.15E 05	4.92E 05	4.86E 05	4.90E 05	4.96E 05	5.01E 05	5.05E 05
19	0.47500	0.00	0.00	0.00	0.00	4.92E 05	5.07E 05	4.85E 05	4.81E 05	4.85E 05	4.91E 05	4.96E 05	4.98E 05
18	0.44750	0.00	0.00	0.00	0.00	4.69E 05	4.93E 05	4.74E 05	4.71E 05	4.77E 05	4.82E 05	4.86E 05	4.88E 05
17	0.42750	0.00	0.00	0.00	4.99E 05	4.65E 05	4.77E 05	4.63E 05	4.64E 05	4.70E 05	4.75E 05	4.78E 05	4.79E 05
16	0.40625	0.00	0.00	0.00	4.67E 05	4.63E 05	4.59E 05	4.51E 05	4.55E 05	4.62E 05	4.66E 05	4.68E 05	4.68E 05
15	0.38500	0.00	0.00	0.00	4.27E 05	4.51E 05	4.41E 05	4.38E 05	4.44E 05	4.52E 05	4.56E 05	4.58E 05	4.57E 05
14	0.36500	0.00	0.00	5.08E 05	4.21E 05	4.32E 05	4.24E 05	4.25E 05	4.34E 05	4.42E 05	4.45E 05	4.47E 05	4.46E 05
13	0.34625	0.00	0.00	4.65E 05	4.26E 05	4.14E 05	4.08E 05	4.13E 05	4.23E 05	4.31E 05	4.34E 05	4.36E 05	4.36E 05
12	0.32750	0.00	0.00	4.03E 05	4.14E 05	3.98E 05	3.93E 05	4.00E 05	4.11E 05	4.19E 05	4.22E 05	4.24E 05	4.24E 05
11	0.29750	0.00	3.83E 05										

[illegible]

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.94E 01	1.96E 01	1.97E 01	1.98E 01	2.00E 01	2.08E 01	2.23E 01	2.41E 01
19	0.05937	0.00	0.00	0.00	0.00	2.01E 01	2.01E 01	2.02E 01	2.05E 01	2.10E 01	2.20E 01	2.35E 01	2.52E 01
18	0.05594	0.00	0.00	0.00	0.00	2.08E 01	2.05E 01	2.06E 01	2.09E 01	2.17E 01	2.29E 01	2.42E 01	2.56E 01
17	0.05344	0.00	0.00	0.00	2.30E 01	2.17E 01	2.12E 01	2.12E 01	2.16E 01	2.25E 01	2.36E 01	2.47E 01	2.57E 01
16	0.05078	0.00	0.00	0.00	2.38E 01	2.22E 01	2.15E 01	2.17E 01	2.25E 01	2.35E 01	2.44E 01	2.51E 01	2.57E 01
15	0.04812	0.00	0.00	0.00	2.48E 01	2.25E 01	2.18E 01	2.23E 01	2.34E 01	2.45E 01	2.51E 01	2.54E 01	2.57E 01
14	0.04562	0.00	0.00	2.97E 01	2.60E 01	2.27E 01	2.20E 01	2.30E 01	2.43E 01	2.52E 01	2.56E 01	2.56E 01	2.55E 01
13	0.04328	0.00	0.00	3.08E 01	2.59E 01	2.23E 01	2.21E 01	2.36E 01	2.51E 01	2.58E 01	2.59E 01	2.56E 01	2.53E 01
12	0.04094	0.00	0.00	3.22E 01	2.58E 01	2.20E 01	2.23E 01	2.43E 01	2.57E 01	2.62E 01	2.60E 01	2.55E 01	2.49E 01
11	0.03719	0.00	4.27E 01	3.44E 01	2.56E 01	2.17E 01	2.28E 01	2.51E 01	2.62E 01	2.63E 01	2.58E 01	2.49E 01	2.41E 01
10	0.03437	0.00	4.49E 01	3.41E 01	2.44E 01	2.10E 01	2.31E 01	2.52E 01	2.61E 01	2.59E 01	2.52E 01	2.42E 01	2.32E 01
9	0.03219	0.00	4.77E 01	3.40E 01	2.36E 01	2.09E 01	2.32E 01	2.50E 01	2.57E 01	2.54E 01	2.46E 01	2.35E 01	2.24E 01
8	0.03031	6.43E 01	5.07E 01	3.36E 01	2.29E 01	2.08E 01	2.30E 01	2.46E 01	2.51E 01	2.47E 01	2.38E 01	2.28E 01	2.16E 01
7	0.02687	6.43E 01	4.95E 01	3.19E 01	2.17E 01	2.05E 01	2.22E 01	2.33E 01	2.36E 01	2.31E 01	2.22E 01	2.11E 01	2.00E 01
6	0.02187	6.43E 01	4.70E 01	2.86E 01	1.96E 01	1.92E 01	1.98E 01	2.03E 01	2.04E 01	2.00E 01	1.92E 01	1.82E 01	1.71E 01
5	0.01625	6.43E 01	4.30E 01	2.37E 01	1.54E 01	1.59E 01	1.58E 01	1.59E 01	1.58E 01	1.55E 01	1.49E 01	1.42E 01	1.33E 01
4	0.01062	6.43E 01	3.74E 01	1.66E 01	1.17E 01	1.13E 01	1.09E 01	1.07E 01	1.07E 01	1.05E 01	1.01E 01	9.59E 00	8.96E 00
3	0.00562	6.43E 01	2.88E 01	6.22E 00	6.58E 00	6.24E 00	5.95E 00	5.82E 00	5.78E 00	5.69E 00	5.50E 00	5.21E 00	4.87E 00
2	0.00156	6.43E 01	8.00E 00	1.73E 00	1.83E 00	1.73E 00	1.65E 00	1.62E 00	1.60E 00	1.58E 00	1.53E 00	1.45E 00	1.35E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.58E 01	2.70E 01	2.77E 01	2.80E 01	2.78E 01	2.74E 01	2.67E 01	2.60E 01	2.52E 01	2.49E 01	0.00	0.00
19	0.05937	2.67E 01	2.78E 01	2.84E 01	2.87E 01	2.87E 01	2.85E 01	2.82E 01	2.78E 01	2.73E 01	2.68E 01	0.00	0.00
18	0.05594	2.67E 01	2.75E 01	2.79E 01	2.81E 01	2.81E 01	2.79E 01	2.76E 01	2.72E 01	2.68E 01	2.64E 01	0.00	0.00
17	0.05344	2.65E 01	2.71E 01	2.74E 01	2.74E 01	2.73E 01	2.71E 01	2.67E 01	2.64E 01	2.60E 01	2.56E 01	0.00	0.00
16	0.05078	2.62E 01	2.65E 01	2.66E 01	2.66E 01	2.64E 01	2.61E 01	2.57E 01	2.54E 01	2.50E 01	2.45E 01	0.00	0.00
15	0.04812	2.59E 01	2.59E 01	2.59E 01	2.57E 01	2.54E 01	2.50E 01	2.46E 01	2.42E 01	2.38E 01	2.34E 01	0.00	0.00
14	0.04562	2.54E 01	2.53E 01	2.50E 01	2.47E 01	2.44E 01	2.40E 01	2.35E 01	2.31E 01	2.27E 01	2.23E 01	0.00	0.00
13	0.04328	2.50E 01	2.46E 01	2.42E 01	2.38E 01	2.34E 01	2.29E 01	2.25E 01	2.21E 01	2.16E 01	2.12E 01	0.00	0.00
12	0.04094	2.44E 01	2.39E 01	2.33E 01	2.28E 01	2.24E 01	2.19E 01	2.14E 01	2.10E 01	2.05E 01	2.01E 01	0.00	0.00
11	0.03719	2.33E 01	2.25E 01	2.18E 01	2.12E 01	2.06E 01	2.01E 01	1.96E 01	1.92E 01	1.88E 01	1.84E 01	0.00	0.00
10	0.03437	2.22E 01	2.14E 01	2.06E 01	1.99E 01	1.93E 01	1.88E 01	1.82E 01	1.78E 01	1.74E 01	1.70E 01	0.00	0.00
9	0.03219	2.14E 01	2.04E 01	1.96E 01	1.88E 01	1.82E 01	1.77E 01	1.72E 01	1.67E 01	1.63E 01	1.60E 01	0.00	0.00
8	0.03031	2.05E 01	1.95E 01	1.87E 01	1.79E 01	1.73E 01	1.67E 01	1.62E 01	1.58E 01	1.54E 01	1.50E 01	0.00	0.00
7	0.02687	1.88E 01	1.78E 01	1.69E 01	1.61E 01	1.55E 01	1.50E 01	1.45E 01	1.41E 01	1.37E 01	1.34E 01	0.00	0.00
6	0.02187	1.60E 01	1.50E 01	1.41E 01	1.34E 01	1.28E 01	1.23E 01	1.19E 01	1.15E 01	1.12E 01	1.09E 01	0.00	0.00
5	0.01625	1.23E 01	1.15E 01	1.08E 01	1.02E 01	9.68E 00	9.27E 00	8.92E 00	8.63E 00	8.37E 00	8.15E 00	0.00	0.00
4	0.01062	8.32E 00	7.72E 00	7.20E 00	6.77E 00	6.42E 00	6.13E 00	5.89E 00	5.69E 00	5.51E 00	5.36E 00	0.00	0.00
3	0.00562	4.51E 00	4.17E 00	3.88E 00	3.64E 00	3.45E 00	3.29E 00	3.16E 00	3.05E 00	2.95E 00	2.87E 00	0.00	0.00
2	0.00156	1.25E 00	1.16E 00	1.08E 00	1.01E 00	9.58E-01	9.14E-01	8.77E-01	8.47E-01	8.20E-01	7.97E-01	0.00	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

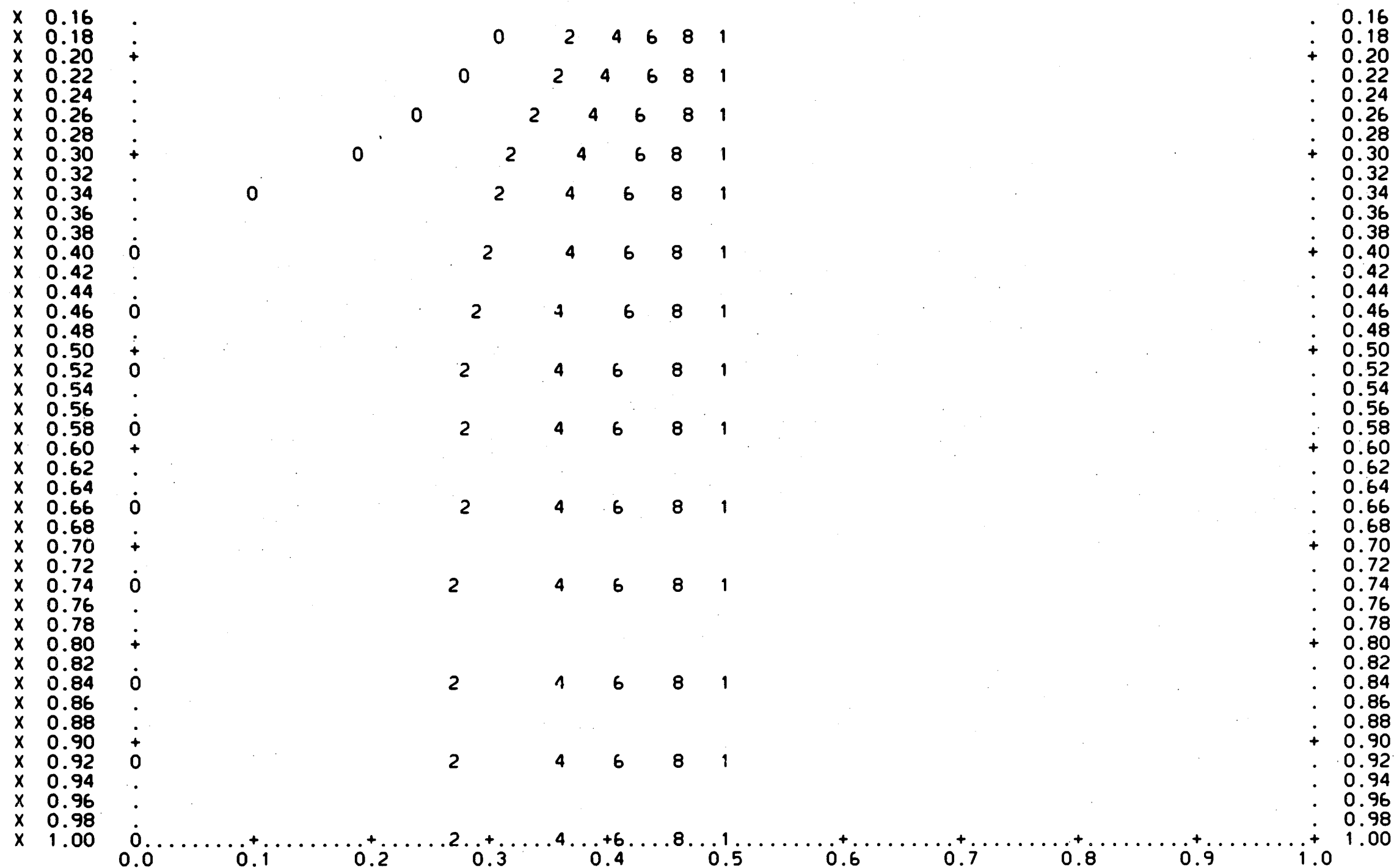
0	*****												
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.60E 03	1.64E 03	1.58E 03	1.57E 03	1.59E 03	1.61E 03	1.63E 03	1.64E 03

18	0.43750	0.00	0.00	0.00	0.00	3.43E-01	1.02E-01	3.54E-03	-2.45E-02	-2.55E-02	-2.05E-02	-1.55E-02	-1.12E-02
17	0.41687	0.00	0.00	0.00	2.12E-01	3.37E-01	1.09E-01	-6.14E-03	-3.87E-02	-3.78E-02	-2.91E-02	-2.13E-02	-1.52E-02
16	0.39562	0.00	0.00	0.00	4.14E-01	3.52E-01	1.11E-01	-1.83E-02	-5.35E-02	-4.92E-02	-3.67E-02	-2.66E-02	-1.90E-02
15	0.37500	0.00	0.00	0.00	6.23E-01	3.62E-01	1.01E-01	-3.37E-02	-6.60E-02	-5.74E-02	-4.22E-02	-3.08E-02	-2.22E-02
14	0.35562	0.00	0.00	2.85E-01	5.90E-01	3.49E-01	8.06E-02	-4.86E-02	-7.39E-02	-6.19E-02	-4.57E-02	-3.38E-02	-2.48E-02
13	0.33687	0.00	0.00	5.10E-01	5.95E-01	3.30E-01	5.84E-02	-5.91E-02	-7.73E-02	-6.37E-02	-4.76E-02	-3.59E-02	-2.68E-02
12	0.31250	0.00	0.00	7.92E-01	6.11E-01	2.93E-01	2.58E-02	-6.69E-02	-7.66E-02	-6.32E-02	-4.86E-02	-3.79E-02	-2.90E-02
11	0.28625	0.00	3.59E-01	7.90E-01	5.99E-01	2.19E-01	-5.87E-03	-6.36E-02	-6.98E-02	-5.93E-02	-4.77E-02	-3.85E-02	-3.02E-02
10	0.26625	0.00	5.95E-01	8.30E-01	5.75E-01	1.56E-01	-1.95E-02	-5.76E-02	-6.29E-02	-5.53E-02	-4.61E-02	-3.82E-02	-3.05E-02
9	0.25000	0.00	8.06E-01	8.56E-01	5.41E-01	1.07E-01	-2.52E-02	-5.18E-02	-5.68E-02	-5.15E-02	-4.43E-02	-3.76E-02	-3.05E-02
8	0.22875	0.00	7.83E-01	8.60E-01	4.77E-01	4.99E-02	-2.90E-02	-4.38E-02	-4.86E-02	-4.63E-02	-4.17E-02	-3.64E-02	-3.00E-02
7	0.19500	0.00	7.75E-01	8.32E-01	3.34E-01	-1.84E-02	-2.91E-02	-3.21E-02	-3.64E-02	-3.78E-02	-3.66E-02	-3.34E-02	-2.83E-02
6	0.15250	0.00	7.84E-01	7.32E-01	8.49E-02	-2.97E-02	-2.51E-02	-2.16E-02	-2.40E-02	-2.76E-02	-2.91E-02	-2.79E-02	-2.43E-02
5	0.10750	0.00	7.82E-01	4.67E-01	-5.81E-02	-3.30E-02	-2.00E-02	-1.40E-02	-1.46E-02	-1.80E-02	-2.05E-02	-2.07E-02	-1.83E-02
4	0.06500	0.00	6.97E-01	7.36E-02	-2.82E-02	-2.25E-02	-1.32E-02	-8.26E-03	-8.06E-03	-1.03E-02	-1.23E-02	-1.29E-02	-1.15E-02
3	0.02875	0.00	3.85E-01	-3.51E-02	-1.45E-02	-1.05E-02	-6.07E-03	-3.64E-03	-3.43E-03	-4.47E-03	-5.43E-03	-5.74E-03	-5.19E-03
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015

0 J	Y												
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	-1.54E-03	-8.61E-04	-3.98E-04	-1.51E-04	-4.58E-05	-1.90E-05	5.50E-06	1.60E-05	6.69E-05	1.16E-06	0.00	0.00
19	0.46125	-4.35E-03	-2.44E-03	-1.16E-03	-4.52E-04	-1.07E-04	3.00E-05	1.34E-04	1.86E-04	2.34E-04	1.31E-06	0.00	0.00
18	0.43750	-7.34E-03	-4.22E-03	-2.14E-03	-9.51E-04	-3.37E-04	-5.33E-05	1.56E-04	2.66E-04	3.33E-04	1.31E-06	0.00	0.00
17	0.41687	-9.98E-03	-5.86E-03	-3.10E-03	-1.49E-03	-6.30E-04	-2.04E-04	1.07E-04	2.74E-04	3.77E-04	1.61E-06	0.00	0.00
16	0.39562	-1.26E-02	-7.57E-03	-4.17E-03	-2.13E-03	-1.01E-03	-4.24E-04	1.97E-07	2.31E-04	3.84E-04	2.25E-06	0.00	0.00
15	0.37500	-1.50E-02	-9.19E-03	-5.22E-03	-2.80E-03	-1.43E-03	-6.81E-04	-1.42E-04	1.55E-04	3.64E-04	3.09E-06	0.00	0.00
14	0.35562	-1.70E-02	-1.06E-02	-6.20E-03	-3.44E-03	-1.84E-03	-9.42E-04	-2.96E-04	6.35E-05	3.28E-04	3.91E-06	0.00	0.00
13	0.33687	-1.87E-02	-1.19E-02	-7.10E-03	-4.04E-03	-2.24E-03	-1.20E-03	-4.55E-04	-3.54E-05	2.82E-04	4.58E-06	0.00	0.00
12	0.31250	-2.06E-02	-1.34E-02	-8.19E-03	-4.80E-03	-2.74E-03	-1.54E-03	-6.65E-04	-1.71E-04	2.14E-04	5.10E-06	0.00	0.00
11	0.28625	-2.19E-02	-1.46E-02	-9.09E-03	-5.45E-03	-3.20E-03	-1.84E-03	-8.68E-04	-3.08E-04	1.36E-04	4.82E-06	0.00	0.00
10	0.26625	-2.25E-02	-1.52E-02	-9.61E-03	-5.85E-03	-3.48E-03	-2.04E-03	-1.00E-03	-4.00E-04	7.91E-05	4.08E-06	0.00	0.00
9	0.25000	-2.27E-02	-1.55E-02	-9.91E-03	-6.09E-03	-3.67E-03	-2.17E-03	-1.09E-03	-4.66E-04	3.60E-05	3.22E-06	0.00	0.00
8	0.22875	-2.27E-02	-1.57E-02	-1.02E-02	-6.33E-03	-3.85E-03	-2.30E-03	-1.19E-03	-5.41E-04	-1.65E-05	2.00E-06	0.00	0.00
7	0.19500	-2.18E-02	-1.54E-02	-1.01E-02	-6.41E-03	-3.95E-03	-2.39E-03	-1.28E-03	-6.15E-04	-8.24E-05	4.17E-07	0.00	0.00
6	0.15250	-1.91E-02	-1.37E-02	-9.22E-03	-5.92E-03	-3.68E-03	-2.25E-03	-1.23E-03	-6.19E-04	-1.26E-04	-6.15E-07	0.00	0.00
5	0.10750	-1.47E-02	-1.07E-02	-7.26E-03	-4.72E-03	-2.95E-03	-1.81E-03	-1.01E-03	-5.20E-04	-1.27E-04	-7.76E-07	0.00	0.00
4	0.06500	-9.31E-03	-6.84E-03	-4.68E-03	-3.07E-03	-1.92E-03	-1.18E-03	-6.63E-04	-3.47E-04	-9.21E-05	-4.49E-07	0.00	0.00
3	0.02875	-4.20E-03	-3.10E-03	-2.13E-03	-1.40E-03	-8.77E-04	-5.39E-04	-3.04E-04	-1.60E-04	-4.41E-05	-1.47E-07	0.00	0.00
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	6.48E-01	6.52E-01	6.55E-01	6.59E-01	6.67E-01	6.93E-01	7.43E-01	8.05E-01
19	0.47500	0.00	0.00	0.00	0.00	6.70E-01	6.70E-01	6.75E-01	6.83E-01	6.99E-01	7.32E-01	7.84E-01	8.40E-01
18	0.44750	0.00	0.00	0.00	0.00	6.92E-01	6.83E-01	6.86E-01	6.98E-01	7.22E-01	7.62E-01	8.08E-01	8.52E-01
17	0.42750	0.00	0.00	0.00	7.67E-01	7.25E-01	7.05E-01	7.05E-01	7.19E-01	7.50E-01	7.87E-01	8.23E-01	8.56E-01
16	0.40625	0.00	0.00	0.00	7.93E-01	7.38E-01	7.18E-01	7.25E-01	7.49E-01	7.83E-01	8.14E-01	8.37E-01	8.58E-01
15	0.38500	0.00	0.00	0.00	8.26E-01	7.50E-01	7.27E-01	7.45E-01	7.81E-01	8.15E-01	8.37E-01	8.48E-01	8.56E-01
14	0.36500	0.00	0.00	9.91E-01	8.68E-01	7.57E-01	7.33E-01	7.67E-01	8.11E-01	8.42E-01	8.54E-01	8.54E-01	8.51E-01



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE

SYMBOL

MAXIMUM VALUES 0.376E 02 0.405E 02 0.429E 02 0.452E 02 0.475E 02 0.500E 02

00 02 04 06 08 10
0 2 4 6 8 1

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

```
0*- - - - - U VELOCITY - - - - -
0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = 0.00000 0.00000 0.00787 0.01617 0.02539 0.03561 0.04697 0.05957 0.07356 0.08909 0.10632 0.12545
0 J Y
21 0.06312 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06187 0.00 0.00 0.00 0.00 0.00 7.66E 00 1.40E 01 1.49E 01 1.40E 01 1.30E 01 1.21E 01 1.13E 01
19 0.05937 0.00 0.00 0.00 0.00 0.00 1.22E 01 1.66E 01 1.68E 01 1.55E 01 1.42E 01 1.29E 01 1.19E 01
18 0.05594 0.00 0.00 0.00 0.00 0.00 1.71E 01 1.94E 01 1.85E 01 1.66E 01 1.47E 01 1.31E 01 1.20E 01
17 0.05344 0.00 0.00 0.00 0.00 2.36E 01 2.10E 01 2.07E 01 1.87E 01 1.64E 01 1.43E 01 1.29E 01 1.18E 01
16 0.05078 0.00 0.00 0.00 0.00 2.10E 01 2.06E 01 1.95E 01 1.73E 01 1.51E 01 1.35E 01 1.23E 01 1.14E 01
15 0.04812 0.00 0.00 0.00 0.00 2.15E 01 2.00E 01 1.72E 01 1.48E 01 1.32E 01 1.22E 01 1.15E 01 1.08E 01
14 0.04562 0.00 0.00 0.00 3.24E 01 2.36E 01 1.82E 01 1.39E 01 1.18E 01 1.11E 01 1.08E 01 1.05E 01 1.01E 01
13 0.04328 0.00 0.00 0.00 2.44E 01 2.00E 01 1.39E 01 9.92E 00 8.90E 00 9.14E 00 9.45E 00 9.49E 00 9.33E 00
12 0.04094 0.00 0.00 0.00 2.14E 01 1.74E 01 1.00E 01 6.15E 00 6.18E 00 7.25E 00 8.05E 00 8.41E 00 8.47E 00
11 0.03719 0.00 0.00 2.97E 01 2.16E 01 1.37E 01 3.35E 00 9.73E -01 2.53E 00 4.44E 00 5.77E 00 6.52E 00 6.92E 00
10 0.03437 0.00 0.00 2.10E 01 1.76E 01 7.68E 00 -1.16E 00 -1.79E 00 2.96E -01 2.48E 00 4.05E 00 5.05E 00 5.68E 00
9 0.03219 0.00 0.00 1.99E 01 1.55E 01 3.31E 00 -3.55E 00 -3.42E 00 -1.21E 00 1.05E 00 2.73E 00 3.88E 00 4.68E 00
8 0.03031 0.00 3.00E 01 2.16E 01 1.37E 01 7.61E -01 -5.02E 00 -4.56E 00 -2.38E 00 -1.26E -01 1.62E 00 2.88E 00 3.82E 00
7 0.02687 0.00 3.00E 01 2.20E 01 1.07E 01 -3.73E 00 -6.84E 00 -6.14E 00 -4.23E 00 -2.13E 00 -3.55E -01 1.07E 00 2.24E 00
6 0.02187 0.00 3.00E 01 2.07E 01 4.38E 00 -8.25E 00 -8.53E 00 -7.81E 00 -6.44E 00 -4.72E 00 -3.01E 00 -1.42E 00 3.08E -02
5 0.01625 0.00 3.00E 01 1.62E 01 -6.76E 00 -1.05E 01 -1.00E 01 -9.30E 00 -8.37E 00 -7.09E 00 -5.54E 00 -3.84E 00 -2.15E 00
4 0.01062 0.00 3.00E 01 5.54E 00 -1.52E 01 -1.27E 01 -1.13E 01 -1.05E 01 -9.76E 00 -8.79E 00 -7.41E 00 -5.68E 00 -3.82E 00
3 0.00562 0.00 3.00E 01 -1.21E 01 -1.60E 01 -1.38E 01 -1.21E 01 -1.12E 01 -1.05E 01 -9.70E 00 -8.43E 00 -6.71E 00 -4.76E 00
2 0.00156 0.00 3.00E 01 -2.35E 01 -1.70E 01 -1.43E 01 -1.24E 01 -1.14E 01 -1.08E 01 -1.00E 01 -8.79E 00 -7.08E 00 -5.11E 00
1 -0.00156 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 0.14669 0.17026 0.19643 0.22547 0.25771 0.29349 0.33321 0.37500 0.41679 0.45858 0.50037
0 J Y
21 0.06312 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06187 1.07E 01 1.03E 01 1.01E 01 1.00E 01 1.00E 01 1.00E 01 1.01E 01 1.01E 01 1.01E 01 1.02E 01 1.02E 01
19 0.05937 1.11E 01 1.07E 01 1.04E 01 1.03E 01 1.02E 01 1.03E 01 1.03E 01 1.04E 01 1.05E 01 1.06E 01 1.06E 01
18 0.05594 1.12E 01 1.06E 01 1.03E 01 1.01E 01 9.99E 00 9.94E 00 9.93E 00 9.95E 00 9.99E 00 1.00E 01 1.00E 01
17 0.05344 1.10E 01 1.05E 01 1.01E 01 9.87E 00 9.71E 00 9.62E 00 9.56E 00 9.54E 00 9.55E 00 9.56E 00 9.56E 00
16 0.05078 1.07E 01 1.02E 01 9.81E 00 9.54E 00 9.35E 00 9.22E 00 9.14E 00 9.09E 00 9.06E 00 9.06E 00 9.06E 00
15 0.04812 1.03E 01 9.79E 00 9.42E 00 9.15E 00 8.94E 00 8.80E 00 8.69E 00 8.62E 00 8.58E 00 8.56E 00 8.56E 00
14 0.04562 9.69E 00 9.31E 00 8.98E 00 8.72E 00 8.52E 00 8.37E 00 8.25E 00 8.18E 00 8.12E 00 8.09E 00 8.09E 00
13 0.04328 9.07E 00 8.78E 00 8.51E 00 8.28E 00 8.09E 00 7.95E 00 7.84E 00 7.76E 00 7.70E 00 7.66E 00 7.66E 00
12 0.04094 8.37E 00 8.19E 00 7.99E 00 7.80E 00 7.64E 00 7.51E 00 7.41E 00 7.33E 00 7.28E 00 7.24E 00 7.24E 00
11 0.03719 7.09E 00 7.12E 00 7.07E 00 6.98E 00 6.88E 00 6.80E 00 6.72E 00 6.66E 00 6.61E 00 6.57E 00 6.57E 00
10 0.03437 6.06E 00 6.26E 00 6.33E 00 6.33E 00 6.30E 00 6.25E 00 6.21E 00 6.17E 00 6.12E 00 6.09E 00 6.09E 00
9 0.03219 5.23E 00 5.56E 00 5.74E 00 5.81E 00 5.84E 00 5.83E 00 5.82E 00 5.79E 00 5.76E 00 5.73E 00 5.73E 00
8 0.03031 4.50E 00 4.95E 00 5.22E 00 5.37E 00 5.45E 00 5.48E 00 5.49E 00 5.48E 00 5.46E 00 5.43E 00 5.43E 00
7 0.02687 3.17E 00 3.84E 00 4.29E 00 4.57E 00 4.75E 00 4.85E 00 4.91E 00 4.93E 00 4.93E 00 4.91E 00 4.91E 00
6 0.02187 1.28E 00 2.25E 00 2.96E 00 3.46E 00 3.78E 00 4.00E 00 4.14E 00 4.21E 00 4.23E 00 4.22E 00 4.22E 00
5 0.01625 -6.01E -01 6.79E -01 1.66E 00 2.36E 00 2.85E 00 3.18E 00 3.40E 00 3.52E 00 3.58E 00 3.58E 00 3.58E 00
4 0.01062 -2.05E 00 -5.37E -01 6.48E -01 1.52E 00 2.14E 00 2.57E 00 2.86E 00 3.02E 00 3.10E 00 3.11E 00 3.11E 00
```


O	J	Y																				
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	
20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.68E 01	1.54E 01	1.42E 01	1.32E 01	1.25E 01	1.21E 01	1.24E 01	1.38E 01							
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	2.77E 02	2.75E 02	2.31E 02	1.93E 02	1.63E 02	1.48E 02	2.00E 02	3.26E 02							
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.18E 02	2.52E 02	2.23E 02	2.04E 02	1.91E 02	2.22E 02	4.21E 02	6.98E 02							
17	0.42750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	4.95E 01	1.43E 02	1.49E 02	1.60E 02	1.71E 02	1.88E 02	3.09E 02	6.19E 02	9.29E 02								
16	0.40625	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.05E 02	1.94E 02	1.57E 02	1.49E 02	1.57E 02	2.19E 02	4.74E 02	8.38E 02	1.14E 03								
15	0.38500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	2.83E 02	1.49E 02	1.28E 02	1.29E 02	1.61E 02	3.38E 02	6.92E 02	1.05E 03	1.33E 03								
14	0.36500	1.00E 00	1.00E 00	1.00E 00	5.52E 01	1.09E 02	1.04E 02	1.13E 02	1.33E 02	2.34E 02	5.35E 02	9.03E 02	1.23E 03	1.48E 03								
13	0.34625	1.00E 00	1.00E 00	1.00E 00	2.93E 02	1.29E 02	1.03E 02	1.26E 02	1.82E 02	3.89E 02	7.39E 02	1.08E 03	1.38E 03	1.61E 03								
12	0.32750	1.00E 00	1.00E 00	1.00E 00	2.64E 02	8.98E 01	9.54E 01	1.48E 02	2.77E 02	5.80E 02	9.32E 02	1.25E 03	1.52E 03	1.72E 03								
11	0.29750	1.00E 00	9.81E 01	8.71E 01	5.49E 01	9.91E 01	2.12E 02	5.20E 02	8.93E 02	1.21E 03	1.48E 03	1.71E 03	1.89E 03									
10	0.27500	1.00E 00	3.77E 02	8.54E 01	4.57E 01	1.25E 02	3.61E 02	7.37E 02	1.08E 03	1.37E 03	1.62E 03	1.83E 03	2.00E 03									
9	0.25750	1.00E 00	3.89E 02	3.83E 01	3.60E 01	1.63E 02	4.80E 02	8.88E 02	1.20E 03	1.47E 03	1.72E 03	1.92E 03	2.07E 03									
8	0.24250	1.00E 00	7.00E 00	6.61E 00	3.59E 01	2.16E 02	5.96E 02	1.00E 03	1.30E 03	1.56E 03	1.79E 03	1.99E 03	2.13E 03									
7	0.21500	1.00E 00	6.98E 00	7.65E 00	5.57E 01	3.20E 02	8.41E 02	1.19E 03	1.46E 03	1.70E 03	1.91E 03	2.09E 03	2.22E 03									
6	0.17500	1.00E 00	7.00E 00	1.12E 01	1.12E 02	6.13E 02	1.13E 03	1.42E 03	1.66E 03	1.87E 03	2.06E 03	2.22E 03	2.33E 03									
5	0.13000	1.00E 00	7.05E 00	2.57E 01	2.86E 02	8.60E 02	1.40E 03	1.64E 03	1.84E 03	2.03E 03	2.20E 03	2.34E 03	2.43E 03									
4	0.08500	1.00E 00	7.28E 00	9.17E 01	1.12E 03	1.20E 03	1.62E 03	1.81E 03	1.98E 03	2.15E 03	2.30E 03	2.43E 03	2.51E 03									
3	0.04500	1.00E 00	8.36E 00	3.94E 02	1.19E 03	1.47E 03	1.77E 03	1.93E 03	2.09E 03	2.24E 03	2.39E 03	2.50E 03	2.57E 03									
2	0.01250	1.00E 00	1.83E 01	8.25E 02	1.47E 03	1.65E 03	1.88E 03	2.02E 03	2.18E 03	2.33E 03	2.47E 03	2.58E 03	2.64E 03									
1	0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	

0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 1.26289 1.46130 1.68153 1.92598 2.19733 2.49852 2.83285 3.16718 3.50150 3.83583 4.17015

O	J	Y																				
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	
20	0.49500	1.50E 01	1.53E 01	1.50E 01	1.45E 01	1.39E 01	1.34E 01	1.29E 01	1.25E 01	1.22E 01	1.21E 01	1.20E 01	1.19E 01	1.18E 01	1.17E 01	1.16E 01	1.15E 01	1.14E 01	1.13E 01	1.12E 01	1.11E 01	
19	0.47500	4.00E 02	4.03E 02	3.66E 02	3.11E 02	2.53E 02	2.00E 02	1.56E 02	1.25E 02	1.02E 02	1.04E 02	1.00E 02	1.00E 02	1.00E 02	1.00E 02	1.00E 02	1.00E 02	1.00E 02	1.00E 02	1.00E 02	1.00E 02	
18	0.44750	8.42E 02	8.48E 02	7.78E 02	6.75E 02	5.65E 02	4.62E 02	3.75E 02	3.07E 02	2.56E 02	2.68E 02	2.68E 02	2.68E 02	2.68E 02	2.68E 02	2.68E 02	2.68E 02	2.68E 02	2.68E 02	2.68E 02	2.68E 02	
17	0.42750	1.09E 03	1.10E 03	1.02E 03	8.97E 02	7.64E 02	6.38E 02	5.31E 02	4.46E 02	3.80E 02	4.01E 02	4.01E 02	4.01E 02	4.01E 02	4.01E 02	4.01E 02	4.01E 02	4.01E 02	4.01E 02	4.01E 02	4.01E 02	
16	0.40625	1.30E 03	1.32E 03	1.23E 03	1.10E 03	9.48E 02	8.05E 02	6.82E 02	5.84E 02	5.08E 02	5.35E 02	5.35E 02	5.35E 02	5.35E 02	5.35E 02	5.35E 02	5.35E 02	5.35E 02	5.35E 02	5.35E 02	5.35E 02	
15	0.38500	1.48E 03	1.49E 03	1.40E 03	1.26E 03	1.10E 03	9.50E 02	8.16E 02	7.09E 02	6.24E 02	6.57E 02	6.57E 02	6.57E 02	6.57E 02	6.57E 02	6.57E 02	6.57E 02	6.57E 02	6.57E 02	6.57E 02	6.57E 02	
14	0.36500	1.62E 03	1.63E 03	1.54E 03	1.40E 03	1.23E 03	1.07E 03	9.26E 02	8.13E 02	7.22E 02	7.57E 02	7.57E 02	7.57E 02	7.57E 02	7.57E 02	7.57E 02	7.57E 02	7.57E 02	7.57E 02	7.57E 02	7.57E 02	
13	0.34625	1.73E 03	1.74E 03	1.65E 03	1.50E 03	1.33E 03	1.16E 03	1.02E 03	8.99E 02	8.04E 02	8.39E 02	8.39E 02	8.39E 02	8.39E 02	8.39E 02	8.39E 02	8.39E 02	8.39E 02	8.39E 02	8.39E 02	8.39E 02	
12	0.32750	1.84E 03	1.84E 03	1.75E 03	1.60E 03	1.42E 03	1.25E 03	1.10E 03	9.75E 02	8.76E 02	9.11E 02	9.11E 02	9.11E 02	9.11E 02	9.11E 02	9.11E 02	9.11E 02	9.11E 02	9.11E 02	9.11E 02	9.11E 02	
11	0.29750	1.99E 03	1.98E 03	1.88E 03	1.72E 03	1.54E 03	1.36E 03	1.21E 03	1.08E 03	9.75E 02	1.01E 03	1.00E 03	1.00E 03	1.00E 03	1.00E 03	1.00E 03	1.00E 03	1.00E 03	1.00E 03	1.00E 03	1.00E 03	
10	0.27500	2.08E 03	2.06E 03	1.96E 03	1.80E 03	1.62E 03	1.44E 03	1.28E 03	1.14E 03	1.04E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	
9	0.25750	2.15E 03	2.12E 03	2.01E 03	1.85E 03	1.67E 03	1.49E 03	1.32E 03	1.19E 03	1.08E 03	1.11E 03	1.11E 03	1.11E 03	1.11E 03	1.11E 03	1.11E 03	1.11E 03	1.11E 03	1.11E 03	1.11E 03	1.11E 03	
8	0.24250	2.20E 03	2.17E 03	2.06E 03	1.89E 03	1.71E 03	1.52E 03	1.36E 03	1.22E 03	1.11E 03	1.14E 03	1.14E 03	1.14E 03	1.14E 03	1.14E 03	1.14E 03	1.14E 03	1.14E 03	1.14E 03	1.14E 03	1.14E 03	
7	0.21500	2.28E 03	2.24E 03	2.12E 03	1.96E 03	1.77E 03	1.58E 03	1.42E 03	1.28E 03	1.17E 03	1.18E 03	1.18E 03	1.18E 03	1.18E 03	1.18E 03	1.18E 03	1.18E 03	1.18E 03	1.18E 03	1.18E 03	1.18E 03	
6	0.17500	2.38E 03	2.33E 03	2.21E 03	2.03E 03	1.84E 03	1.65E 03	1.48E 03	1.34E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	1.23E 03	
5	0.13000	2.46E 03	2.41E 03	2.28E 03	2.10E 03	1.91E 03	1.71E 03	1.54E 03	1.40E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	1.28E 03	
4	0.08500	2.53E 03	2.48E 03	2.34E 03	2.15E 03	1.95E 03	1.76E 03	1.58E 03	1.44E 03	1.31E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	
3	0.04500	2.58E 03	2.52E 03	2.38E 03	2.19E 03	1.99E 03	1.79E 03	1.61E 03	1.46E 03	1.33E 03	1.32E 03	1.32E 03	1.32E 03	1.32E 03	1.32E 03	1.32E 03	1.32E 03	1.32E 03	1.32E 03	1.32E 03	1.32E 03	
2	0.01250	2.65E 03	2.57E 03	2.43E 03	2.22E 03	2.01E 03	1.81E 03	1.62E 03	1.47E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	1.34E 03	
1	0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	

I	X/D	S.S.COEFF.
2	3.148E-02	7.048E-03
3	9.443E-02	4.811E-03

102	0.7407E-01	0.5673E-01	0.3406E-01	0.2392E-01	0.6566E-02	0.3297E	08	0.6062E	01-0.7397E-02	0.1213E	02	0.1291E	04	0.1229E	04
103	0.7042E-01	0.6130E-01	0.3273E-01	0.2307E-01	0.6422E-02	0.3501E	08	0.6048E	01-0.7133E-02	0.1215E	02	0.1292E	04	0.1235E	04
104	0.6957E-01	0.5800E-01	0.3139E-01	0.2199E-01	0.6297E-02	0.3616E	08	0.6036E	01-0.6062E-02	0.1217E	02	0.1292E	04	0.1240E	04
105	0.6938E-01	0.4971E-01	0.3015E-01	0.2127E-01	0.6160E-02	0.3778E	08	0.6023E	01-0.6062E-02	0.1219E	02	0.1293E	04	0.1245E	04
106	0.6566E-01	0.5396E-01	0.2892E-01	0.2047E-01	0.6005E-02	0.3789E	08	0.6011E	01-0.5586E-02	0.1222E	02	0.1294E	04	0.1250E	04
107	0.6493E-01	0.5029E-01	0.2784E-01	0.1938E-01	0.5847E-02	0.3918E	08	0.5999E	01-0.5130E-02	0.1224E	02	0.1294E	04	0.1255E	04
108	0.6272E-01	0.4871E-01	0.2683E-01	0.1864E-01	0.5706E-02	0.4083E	08	0.5989E	01-0.4559E-02	0.1226E	02	0.1295E	04	0.1260E	04
109	0.6121E-01	0.4628E-01	0.2586E-01	0.1784E-01	0.5586E-02	0.4153E	08	0.5979E	01-0.4008E-02	0.1228E	02	0.1296E	04	0.1264E	04
110	0.5970E-01	0.4403E-01	0.2492E-01	0.1705E-01	0.5472E-02	0.4209E	08	0.5969E	01-0.3438E-02	0.1230E	02	0.1296E	04	0.1268E	04
111	0.5840E-01	0.4172E-01	0.2398E-01	0.1631E-01	0.5365E-02	0.4294E	08	0.5961E	01-0.2882E-02	0.1232E	02	0.1297E	04	0.1272E	04
112	0.5703E-01	0.3946E-01	0.2310E-01	0.1560E-01	0.5246E-02	0.4342E	08	0.5953E	01-0.2332E-02	0.1233E	02	0.1298E	04	0.1276E	04
113	0.5572E-01	0.3726E-01	0.2227E-01	0.1494E-01	0.5115E-02	0.4393E	08	0.5947E	01-0.1799E-02	0.1235E	02	0.1298E	04	0.1280E	04
114	0.5446E-01	0.3506E-01	0.2151E-01	0.1428E-01	0.4975E-02	0.4465E	08	0.5940E	01-0.1279E-02	0.1237E	02	0.1299E	04	0.1284E	04
115	0.5330E-01	0.3291E-01	0.2086E-01	0.1359E-01	0.4842E-02	0.4488E	08	0.5935E	01-0.7765E-03	0.1239E	02	0.1300E	04	0.1287E	04
116	0.5222E-01	0.3086E-01	0.2025E-01	0.1302E-01	0.4722E-02	0.4548E	08	0.5931E	01-0.2930E-03	0.1240E	02	0.1300E	04	0.1290E	04
117	0.5131E-01	0.2907E-01	0.1968E-01	0.1241E-01	0.4609E-02	0.4595E	08	0.5927E	01 0.1701E-03	0.1242E	02	0.1301E	04	0.1293E	04
118	0.5054E-01	0.2737E-01	0.1912E-01	0.1183E-01	0.4504E-02	0.4655E	08	0.5924E	01 0.6124E-03	0.1243E	02	0.1302E	04	0.1296E	04
119	0.4979E-01	0.2571E-01	0.1861E-01	0.1133E-01	0.4394E-02	0.4690E	08	0.5922E	01 0.1033E-02	0.1245E	02	0.1302E	04	0.1299E	04
120	0.4900E-01	0.2408E-01	0.1811E-01	0.1083E-01	0.4277E-02	0.4726E	08	0.5920E	01 0.1430E-02	0.1246E	02	0.1303E	04	0.1302E	04
121	0.4832E-01	0.2249E-01	0.1768E-01	0.1034E-01	0.4156E-02	0.4745E	08	0.5919E	01 0.1804E-02	0.1247E	02	0.1304E	04	0.1304E	04
122	0.4774E-01	0.2096E-01	0.1733E-01	0.9857E-02	0.4040E-02	0.4759E	08	0.5919E	01 0.2155E-02	0.1249E	02	0.1304E	04	0.1307E	04
123	0.4717E-01	0.1951E-01	0.1699E-01	0.9474E-02	0.3929E-02	0.4784E	08	0.5919E	01 0.2481E-02	0.1250E	02	0.1305E	04	0.1309E	04
124	0.4663E-01	0.1814E-01	0.1668E-01	0.9046E-02	0.3828E-02	0.4808E	08	0.5920E	01 0.2784E-02	0.1251E	02	0.1305E	04	0.1311E	04
125	0.4627E-01	0.1685E-01	0.1641E-01	0.8635E-02	0.3681E-02	0.4486E	08	0.5922E	01 0.3059E-02	0.1252E	02	0.1306E	04	0.1313E	04
126	0.4588E-01	0.1576E-01	0.1615E-01	0.8314E-02	0.3551E-02	0.4405E	08	0.5924E	01 0.3312E-02	0.1253E	02	0.1307E	04	0.1315E	04
127	0.4544E-01	0.1472E-01	0.1593E-01	0.8029E-02	0.3439E-02	0.4455E	08	0.5926E	01 0.3544E-02	0.1254E	02	0.1307E	04	0.1317E	04
128	0.4500E-01	0.1374E-01	0.1574E-01	0.7709E-02	0.3335E-02	0.4496E	08	0.5929E	01 0.3754E-02	0.1255E	02	0.1308E	04	0.1318E	04
129	0.4456E-01	0.1282E-01	0.1559E-01	0.7452E-02	0.3237E-02	0.4546E	08	0.5932E	01 0.3946E-02	0.1256E	02	0.1308E	04	0.1320E	04
130	0.4407E-01	0.1200E-01	0.1545E-01	0.7228E-02	0.3145E-02	0.4554E	08	0.5936E	01 0.4116E-02	0.1257E	02	0.1309E	04	0.1321E	04
131	0.4354E-01	0.1135E-01	0.1533E-01	0.6943E-02	0.3062E-02	0.4559E	08	0.5940E	01 0.4266E-02	0.1258E	02	0.1309E	04	0.1322E	04
132	0.4300E-01	0.1081E-01	0.1522E-01	0.6754E-02	0.2988E-02	0.4601E	08	0.5945E	01 0.4397E-02	0.1259E	02	0.1310E	04	0.1323E	04
133	0.4245E-01	0.1041E-01	0.1513E-01	0.6576E-02	0.2919E-02	0.4622E	08	0.5950E	01 0.4509E-02	0.1259E	02	0.1310E	04	0.1324E	04
134	0.4187E-01	0.1012E-01	0.1509E-01	0.6396E-02	0.2853E-02	0.4606E	08	0.5955E	01 0.4602E-02	0.1260E	02	0.1311E	04	0.1325E	04
135	0.4126E-01	0.9971E-02	0.1507E-01	0.6256E-02	0.2795E-02	0.4615E	08	0.5960E	01 0.4676E-02	0.1261E	02	0.1311E	04	0.1326E	04
136	0.4063E-01	0.9977E-02	0.1506E-01	0.6076E-02	0.2737E-02	0.4635E	08	0.5966E	01 0.4733E-02	0.1262E	02	0.1312E	04	0.1327E	04
137	0.3999E-01	0.1003E-01	0.1509E-01	0.5984E-02	0.2681E-02	0.4621E	08	0.5972E	01 0.4773E-02	0.1262E	02	0.1313E	04	0.1328E	04
138	0.3933E-01	0.1013E-01	0.1514E-01	0.5856E-02	0.2631E-02	0.4620E	08	0.5978E	01 0.4797E-02	0.1263E	02	0.1313E	04	0.1329E	04
139	0.3865E-01	0.1021E-01	0.1523E-01	0.5736E-02	0.2585E-02	0.4612E	08	0.5984E	01 0.4805E-02	0.1264E	02	0.1313E	04	0.1329E	04
140	0.3794E-01	0.1031E-01	0.1533E-01	0.5659E-02	0.2542E-02	0.4612E	08	0.5990E	01 0.4799E-02	0.1264E	02	0.1314E	04	0.1330E	04
141	0.3724E-01	0.1042E-01	0.1544E-01	0.5579E-02	0.2506E-02	0.4618E	08	0.5997E	01 0.4779E-02	0.1265E	02	0.1314E	04	0.1330E	04
142	0.3652E-01	0.1052E-01	0.1554E-01	0.5523E-02	0.2473E-02	0.4621E	08	0.6003E	01 0.4747E-02	0.1266E	02	0.1315E	04	0.1331E	04
143	0.3579E-01	0.1063E-01	0.1564E-01	0.5469E-02	0.2446E-02	0.4613E	08	0.6010E	01 0.4702E-02	0.1266E	02	0.1315E	04	0.1331E	04
144	0.3507E-01	0.1070E-01	0.1575E-01	0.5404E-02	0.2425E-02	0.4580E	08	0.6016E	01 0.4646E-02	0.1267E	02	0.1316E	04	0.1332E	04
145	0.3434E-01	0.1077E-01	0.1585E-01	0.5377E-02	0.2404E-02	0.4565E	08	0.6023E	01 0.4580E-02	0.1267E	02	0.1316E	04	0.1332E	04
146	0.3362E-01	0.1080E-01	0.1595E-01	0.5324E-02	0.2382E-02	0.4583E	08	0.6029E	01 0.4504E-02	0.1268E	02	0.1317E	04	0.1332E	04
147	0.3289E-01	0.1083E-01	0.1605E-01	0.5329E-02	0.2359E-02	0.4569E	08	0.6036E	01 0.4420E-02	0.1268E	02	0.1317E	04	0.1333E	04
148	0.3217E-01	0.1084E-01	0.1614E-01	0.5332E-02	0.2335E-02	0.4572E	08	0.6043E	01 0.4327E-02	0.1269E	02	0.1318E	04	0.1333E	04
149	0.3145E-01	0.1083E-01	0.1623E-01	0.5292E-02	0.2311E-02	0.4559E	08	0.6049E	01 0.4228E-02	0.1269E	02	0.1318E	04	0.1333E	04
150	0.3074E-01	0.1082E-01	0.1632E-01	0.5277E-02	0.2284E-02	0.4544E	08	0.6055E	01 0.4123E-02	0.1270E	02	0.1319E	04	0.1333E	04
151	0.3004E-01	0.1081E-01	0.1640E-01	0.5273E-02	0.2255E-02	0.4525E	08	0.6062E	01 0.4011E-02	0.1270E	02	0.1319E	04	0.1333E	04
152	0.2934E-01	0.1078E-01	0.1647E-01	0.5298E-02	0.2227E-02	0.4477E	08	0.6068E	01 0.3895E-02	0.1271E	02	0.1319E	04	0.1334E	04
153	0.2866E-01	0.1072E-01	0.1654E-01	0.5273E-02	0.2199E-02	0.4501E	08	0.6074E	01 0.3774E-02	0.1271E	02	0.1320E	04	0.1334E	04
154	0.2799E-01	0.1066E-01	0.1660E-01	0.5281E-02	0.2177E-02	0.4463E	08	0.6080E	01 0.3650E-02	0.1272E	02	0.1320E	04	0.1334E	04
155	0.2734E-01	0.1056E-01	0.1666E-01	0.5279E-02	0.2164E-02	0.4466E	08	0.6086E	01 0.3523E-02	0.1272E	02	0.1321E	04	0.1334E	04

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

[illegible]

TURBULENCE				DISSIPATION								
0	1	2	3	4	5	6	7	8	9	10	11	12
X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

[illegible]

DIMENSIONLESS TURBULENCE ENERGY												
0	1	2	3	4	5	6	7	8	9	10	11	12
8	0.24250	3.73E 05	3.76E 05	3.78E 05	3.79E 05	3.81E 05	3.82E 05	3.84E 05	3.85E 05	3.86E 05	3.87E 05	0.00
7	0.21500	3.57E 05	3.62E 05	3.65E 05	3.68E 05	3.70E 05	3.72E 05	3.74E 05	3.76E 05	3.78E 05	3.79E 05	0.00
6	0.17500	3.36E 05	3.43E 05	3.48E 05	3.52E 05	3.56E 05	3.59E 05	3.62E 05	3.65E 05	3.67E 05	3.69E 05	0.00
5	0.13000	3.15E 05	3.25E 05	3.32E 05	3.38E 05	3.43E 05	3.48E 05	3.51E 05	3.54E 05	3.57E 05	3.60E 05	0.00
4	0.08500	3.00E 05	3.11E 05	3.20E 05	3.28E 05	3.34E 05	3.39E 05	3.43E 05	3.47E 05	3.50E 05	3.54E 05	0.00
3	0.04500	2.91E 05	3.03E 05	3.14E 05	3.22E 05	3.29E 05	3.34E 05	3.39E 05	3.43E 05	3.47E 05	3.50E 05	0.00
2	0.01250	2.88E 05	3.01E 05	3.11E 05	3.20E 05	3.27E 05	3.33E 05	3.38E 05	3.42E 05	3.45E 05	3.49E 05	0.00
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	1	2	3	4	5	6	7	8	9	10	11	12		
0	I =	1	2	3	4	5	6	7	8	9	10	11		
0	J	Y	X = -0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415

0	1	2	3	4	5	6	7	8	9	10	11	12
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	3.91E-03	3.40E-03	2.77E-03	2.34E-03	2.07E-03	2.02E-03	2.41E-03
19	0.47500	0.00	0.00	0.00	0.00	2.13E-02	2.12E-02	1.63E-02	1.25E-02	9.97E-03	9.57E-03	1.24E-02
18	0.44750	0.00	0.00	0.00	0.00	3.03E-02	2.33E-02	1.81E-02	1.45E-02	1.27E-02	1.49E-02	2.03E-02
17	0.42750	0.00	0.00	0.00	1.04E-02	1.86E-02	1.63E-02	1.47E-02	1.38E-02	1.51E-02	2.04E-02	2.63E-02
16	0.40625	0.00	0.00	0.00	3.46E-02	2.24E-02	1.71E-02	1.49E-02	1.55E-02	2.04E-02	2.76E-02	3.28E-02
15	0.38500	0.00	0.00	0.00	3.05E-02	1.94E-02	1.58E-02	1.58E-02	2.03E-02	2.83E-02	3.52E-02	3.90E-02
14	0.36500	0.00	0.00	1.39E-02	1.80E-02	1.66E-02	1.63E-02	1.96E-02	2.78E-02	3.63E-02	4.18E-02	4.40E-02
13	0.34625	0.00	0.00	3.86E-02	2.03E-02	1.78E-02	1.98E-02	2.60E-02	3.55E-02	4.29E-02	4.69E-02	4.80E-02
12	0.32750	0.00	0.00	2.75E-02	1.62E-02	1.87E-02	2.42E-02	3.31E-02	4.23E-02	4.82E-02	5.10E-02	5.11E-02
11	0.29750	0.00	1.84E-02	1.62E-02	1.42E-02	2.25E-02	3.45E-02	4.40E-02	5.07E-02	5.44E-02	5.58E-02	5.48E-02
10	0.27500	0.00	4.92E-02	1.72E-02	1.55E-02	3.01E-02	4.16E-02	4.85E-02	5.37E-02	5.67E-02	5.77E-02	5.64E-02
9	0.25750	0.00	4.19E-02	1.13E-02	1.70E-02	3.76E-02	4.44E-02	4.99E-02	5.45E-02	5.74E-02	5.83E-02	5.70E-02
8	0.24250	3.00E-02	1.00E-02	6.43E-03	2.00E-02	4.36E-02	4.55E-02	5.01E-02	5.45E-02	5.75E-02	5.84E-02	5.72E-02
7	0.21500	3.00E-02	1.00E-02	8.06E-03	2.70E-02	5.23E-02	4.59E-02	4.97E-02	5.38E-02	5.68E-02	5.79E-02	5.68E-02
6	0.17500	3.00E-02	1.01E-02	1.24E-02	4.26E-02	5.23E-02	4.54E-02	4.81E-02	5.18E-02	5.48E-02	5.62E-02	5.53E-02
5	0.13000	3.00E-02	1.04E-02	2.38E-02	6.97E-02	4.61E-02	4.43E-02	4.61E-02	4.92E-02	5.21E-02	5.35E-02	5.27E-02
4	0.08500	3.00E-02	1.18E-02	5.36E-02	4.49E-02	4.26E-02	4.28E-02	4.44E-02	4.69E-02	4.95E-02	5.08E-02	5.02E-02
3	0.04500	3.00E-02	1.80E-02	1.25E-01	4.15E-02	4.14E-02	4.19E-02	4.33E-02	4.56E-02	4.79E-02	4.92E-02	4.87E-02
2	0.01250	3.00E-02	3.84E-02	9.22E-02	4.18E-02	4.10E-02	4.17E-02	4.31E-02	4.54E-02	4.75E-02	4.87E-02	4.82E-02
1	0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	1	2	3	4	5	6	7	8	9	10	11	12	
0	I =	13	14	15	16	17	18	19	20	21	22	23	
0	J	Y	X = 1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015

0	1	2	3	4	5	6	7	8	9	10	11	12
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	3.19E-03	3.14E-03	2.94E-03	2.69E-03	2.46E-03	2.26E-03	2.10E-03	1.97E-03	1.87E-03	1.84E-03	3.00E-02
19	0.47500	1.67E-02	1.57E-02	1.36E-02	1.12E-02	9.06E-03	7.22E-03	5.81E-03	4.80E-03	4.08E-03	4.35E-03	3.00E-02
18	0.44750	2.47E-02	2.26E-02	1.93E-02	1.58E-02	1.26E-02	9.96E-03	7.92E-03	6.43E-03	5.34E-03	5.96E-03	3.00E-02
17	0.42750	2.90E-02	2.61E-02	2.21E-02	1.80E-02	1.43E-02	1.13E-02	8.99E-03	7.30E-03	6.06E-03	6.92E-03	3.00E-02
16	0.40625	3.31E-02	2.93E-02	2.46E-02	1.99E-02	1.58E-02	1.25E-02	9.93E-03	8.08E-03	6.72E-03	7.79E-03	3.00E-02
15	0.38500	3.67E-02	3.21E-02	2.67E-02	2.15E-02	1.71E-02	1.35E-02	1.07E-02	8.73E-03	7.29E-03	8.51E-03	3.00E-02
14	0.36500	3.96E-02	3.42E-02	2.83E-02	2.28E-02	1.81E-02	1.42E-02	1.13E-02	9.25E-03	7.74E-03	9.05E-03	3.00E-02
13	0.34625	4.19E-02	3.60E-02	2.96E-02	2.38E-02	1.88E-02	1.48E-02	1.18E-02	9.66E-03	8.09E-03	9.46E-03	3.00E-02
12	0.32750	4.37E-02	3.74E-02	3.07E-02	2.46E-02	1.95E-02	1.53E-02	1.22E-02	1.00E-02	8.39E-03	9.77E-03	3.00E-02
11	0.29750	4.60E-02	3.91E-02	3.20E-02	2.56E-02	2.02E-02	1.60E-02	1.27E-02	1.04E-02	8.76E-03	1.01E-02	3.00E-02
10	0.27500	4.70E-02	3.99E-02	3.26E-02	2.61E-02	2.06E-02	1.63E-02	1.30E-02	1.07E-02	8.96E-03	1.02E-02	3.00E-02
9	0.25750	4.74E-02	4.02E-02	3.29E-02	2.63E-02	2.08E-02	1.64E-02	1.32E-02	1.08E-02	9.07E-03	1.02E-02	3.00E-02
8	0.24250	4.75E-02	4.03E-02	3.30E-02	2.64E-02	2.09E-02	1.65E-02	1.32E-02	1.09E-02	9.13E-03	1.02E-02	3.00E-02
7	0.21500	4.74E-02	4.03E-02	3.30E-02	2.64E-02	2.10E-02	1.66E-02	1.33E-02	1.09E-02	9.19E-03	1.01E-02	3.00E-02
6	0.17500	4.65E-02	3.96E-02	3.25E-02	2.61E-02	2.08E-02	1.65E-02	1.32E-02	1.09E-02	9.16E-03	9.82E-03	3.00E-02
5	0.13000	4.48E-02	3.84E-02	3.16E-02	2.55E-02	2.04E-02	1.62E-02	1.31E-02	1.08E-02	9.06E-03	9.42E-03	3.00E-02
4	0.08500	4.30E-02	3.71E-02	3.07E-02	2.48E-02	1.99E-02	1.59E-02	1.29E-02	1.06E-02	8.93E-03	9.06E-03	3.00E-02

DIMENSIONLESS STREAMLINE PLOT																			
OITER	I---	ABSOLUTE RESIDUAL		SOURCE SUMS		---	I---	FIELD VALUES AT MONITORING LOCATION(22, 8) ---I											
NO	UMON	VMON	WMON	MASS	TKIN	DISP		U	V	W	P	D							
1	0.1299E-01	0.8470E-02	0.2004E	00	0.3716E-02	0.8115E-02	0.6533E	10	0.6213E	01	0.3374E-03	0.1299E	02	0.1338E	04	0.1340E	04		
2	0.1291E-01	0.2144E	00	0.1718E	00	0.2378E-01	0.1343E-01	0.1067E	11	0.6214E	01	0.3394E-03	0.1299E	02	0.1582E	04	0.1340E	04	
3	0.1090E	00	0.3111E	00	0.1541E	00	0.3639E-01	0.1699E-01	0.1256E	11	0.6214E	01	0.1352E-03	0.1300E	02	0.1813E	04	0.1340E	04
4	0.2877E	00	0.2815E	00	0.1422E	00	0.2393E-01	0.1835E-01	0.1096E	11	0.6215E	01	0.7560E-04	0.1300E	02	0.1770E	04	0.1340E	04
5	0.3010E	00	0.3016E	00	0.1351E	00	0.2578E-01	0.1936E-01	0.8045E	10	0.6215E	01	0.6783E-04	0.1301E	02	0.1713E	04	0.1340E	04
6	0.3303E	00	0.3062E	00	0.1315E	00	0.2873E-01	0.2093E-01	0.7944E	10	0.6215E	01	0.6644E-04	0.1301E	02	0.1650E	04	0.1341E	04
7	0.3441E	00	0.3111E	00	0.1299E	00	0.2921E-01	0.2164E-01	0.7656E	10	0.6215E	01	0.6721E-04	0.1301E	02	0.1593E	04	0.1341E	04
8	0.3512E	00	0.3138E	00	0.1285E	00	0.2945E-01	0.2190E-01	0.7814E	10	0.6216E	01	0.6937E-04	0.1302E	02	0.1547E	04	0.1341E	04
9	0.3557E	00	0.3149E	00	0.1268E	00	0.2996E-01	0.2205E-01	0.7236E	10	0.6216E	01	0.7198E-04	0.1302E	02	0.1510E	04	0.1341E	04
10	0.3577E	00	0.3160E	00	0.1251E	00	0.3073E-01	0.2234E-01	0.6368E	10	0.6216E	01	0.7594E-04	0.1303E	02	0.1482E	04	0.1341E	04
11	0.3614E	00	0.3157E	00	0.1243E	00	0.3132E-01	0.2277E-01	0.5563E	10	0.6216E	01	0.8011E-04	0.1303E	02	0.1463E	04	0.1341E	04
12	0.3636E	00	0.3123E	00	0.1237E	00	0.3236E-01	0.2329E-01	0.5280E	10	0.6217E	01	0.8425E-04	0.1304E	02	0.1450E	04	0.1341E	04
13	0.3669E	00	0.3079E	00	0.1228E	00	0.3357E-01	0.2402E-01	0.5081E	10	0.6217E	01	0.8914E-04	0.1304E	02	0.1442E	04	0.1341E	04
14	0.3701E	00	0.3036E	00	0.1227E	00	0.3488E-01	0.2495E-01	0.4936E	10	0.6217E	01	0.9592E-04	0.1304E	02	0.1438E	04	0.1341E	04
15	0.3734E	00	0.2973E	00	0.1226E	00	0.3619E-01	0.2588E-01	0.4821E	10	0.6218E	01	0.1031E-03	0.1305E	02	0.1437E	04	0.1342E	04
16	0.3757E	00	0.2911E	00	0.1228E	00	0.3752E-01	0.2699E-01	0.4721E	10	0.6218E	01	0.1104E-03	0.1305E	02	0.1437E	04	0.1342E	04
17	0.3775E	00	0.2853E	00	0.1231E	00	0.3942E-01	0.2831E-01	0.4625E	10	0.6218E	01	0.1184E-03	0.1306E	02	0.1439E	04	0.1342E	04
18	0.3792E	00	0.2781E	00	0.1232E	00	0.4026E-01	0.2944E-01	0.4528E	10	0.6219E	01	0.1266E-03	0.1306E	02	0.1441E	04	0.1342E	04
19	0.3792E	00	0.2713E	00	0.1233E	00	0.4003E-01	0.3027E-01	0.4428E	10	0.6219E	01	0.1340E-03	0.1307E	02	0.1445E	04	0.1342E	04
20	0.3782E	00	0.2651E	00	0.1234E	00	0.3976E-01	0.3085E-01	0.4323E	10	0.6219E	01	0.1423E-03	0.1307E	02	0.1449E	04	0.1342E	04
21	0.3769E	00	0.2598E	00	0.1233E	00	0.3939E-01	0.3124E-01	0.4213E	10	0.6220E	01	0.1501E-03	0.1308E	02	0.1453E	04	0.1343E	04
22	0.3745E	00	0.2548E	00	0.1230E	00	0.3887E-01	0.3173E-01	0.4098E	10	0.6220E	01	0.1574E-03	0.1308E	02	0.1458E	04	0.1343E	04
23	0.3718E	00	0.2515E	00	0.1225E	00	0.3832E-01	0.3192E-01	0.3978E	10	0.6221E	01	0.1641E-03	0.1308E	02	0.1462E	04	0.1343E	04
24	0.3697E	00	0.2490E	00	0.1221E	00	0.3823E-01	0.3198E-01	0.3851E	10	0.6221E	01	0.1713E-03	0.1309E	02	0.1466E	04	0.1343E	04
25	0.3673E	00	0.2456E	00	0.1215E	00	0.3779E-01	0.3203E-01	0.3728E	10	0.6221E	01	0.1768E-03	0.1309E	02	0.1470E	04	0.1344E	04
26	0.3638E	00	0.2416E	00	0.1209E	00	0.3713E-01	0.3202E-01	0.3597E	10	0.6222E	01	0.1830E-03	0.1310E	02	0.1474E	04	0.1344E	04
27	0.3606E	00	0.2382E	00	0.1202E	00	0.3639E-01	0.3211E-01	0.3455E	10	0.6222E	01	0.1881E-03	0.1310E	02	0.1478E	04	0.1344E	04
28	0.3577E	00	0.2352E	00	0.1194E	00	0.3570E-01	0.3220E-01	0.3300E	10	0.6223E	01	0.1922E-03	0.1311E	02	0.1481E	04	0.1344E	04
29	0.3550E	00	0.2318E	00	0.1187E	00	0.3476E-01	0.3240E-01	0.3135E	10	0.6223E	01	0.1947E-03	0.1311E	02	0.1484E	04	0.1345E	04
30	0.3508E	00	0.2274E	00	0.1179E	00	0.3474E-01	0.3271E-01	0.2962E	10	0.6224E	01	0.1954E-03	0.1312E	02	0.1486E	04	0.1345E	04
31	0.3461E	00	0.2223E	00	0.1171E	00	0.3480E-01	0.3307E-01	0.2785E	10	0.6224E	01	0.1938E-03	0.1312E	02	0.1489E	04	0.1345E	04
32	0.3421E	00	0.2180E	00	0.1161E	00	0.3499E-01	0.3363E-01	0.2624E	10	0.6225E	01	0.1877E-03	0.1313E	02	0.1490E	04	0.1346E	04
33	0.3377E	00	0.2151E	00	0.1151E	00	0.3527E-01	0.3425E-01	0.2458E	10	0.6225E	01	0.1785E-03	0.1313E	02	0.1492E	04	0.1346E	04
34	0.3328E	00	0.2126E	00	0.1141E	00	0.3563E-01	0.3497E-01	0.2303E	10	0.6226E	01	0.1646E-03	0.1313E	02	0.1493E	04	0.1346E	04
35	0.3276E	00	0.2093E	00	0.1132E	00	0.3605E-01	0.3588E-01	0.2171E	10	0.6226E	01	0.1439E-03	0.1314E	02	0.1494E	04	0.1347E	04
36	0.3213E	00	0.2062E	00	0.1122E	00	0.3666E-01	0.3684E-01	0.2035E	10	0.6227E	01	0.1175E-03	0.1314E	02	0.1495E	04	0.1347E	04
37	0.3160E	00	0.2026E	00	0.1113E	00	0.3723E-01	0.3774E-01	0.1912E	10	0.6227E	01	0.8184E-04	0.1315E	02	0.1495E	04	0.1348E	04
38	0.3107E	00	0.1994E	00	0.1105E	00	0.3783E-01	0.3872E-01	0.1785E	10	0.6228E	01	0.3849E-04	0.1315E	02	0.1496E	04	0.1349E	04
39	0.3047E	00	0.1966E	00	0.1097E	00	0.3850E-01	0.3970E-01	0.1651E	10	0.6228E	01	0.1525E-04	0.1316E	02	0.1496E	04	0.1349E	04
40	0.2985E	00	0.1934E	00	0.1090E	00	0.3923E-01	0.4060E-01	0.1512E	10	0.6228E	01	0.8022E-04	0.1316E	02	0.1497E	04	0.1350E	04
41	0.2917E	00	0.1897E	00	0.1083E	00	0.3985E-01	0.4141E-01	0.1378E	10	0.6229E	01	0.1531E-03	0.1317E	02	0.1497E	04	0.1351E	04
42	0.2859E	00	0.1837E	00	0.1078E	00	0.4011E-01	0.4217E-01	0.1245E	10	0.6229E	01	0.2337E-03	0.1317E	02	0.1497E	04	0.1352E	04
43	0.2798E	00	0.1784E	00	0.1075E	00	0.4066E-01	0.4279E-01	0.1111E	10	0.6229E	01	0.3234E-03	0.1318E	02	0.1497E	04	0.1353E	04
44	0.2741E	00	0.1735E	00	0.1071E	00	0.4126E-01	0.4338E-01	0.9839E	09	0.6229E	01	0.4230E-03	0.1318E	02	0.1497E	04	0.1354E	04
45	0.2689E	00	0.1691E	00	0.1066E	00	0.4201E-01	0.4391E-01	0.9449E	09	0.6229E	01	0.5315E-03	0.1319E	02	0.1497E	04	0.1355E	04
46	0.2643E	00	0.1651E	00	0.1062E	00	0.4280E-01	0.4430E-01	0.9010E	09	0.6228E	01	0.6504E-03	0.1319E	02	0.1497E	04	0.1356E	04
47	0.2600E	00	0.1610E	00	0.1059E	00	0.4361E-01	0.4459E-01	0.8505E	09	0.6228E	01	0.7792E-03	0.1320E	02	0.1497E	04	0.1358E	04
48	0.2557E	00	0.1569E	00	0.1056E	00	0.4448E-01	0.4478E-01	0.8144E	09	0.6227E	01	0.9197E-03	0.1320E	02	0.1497E	04	0.1359E	04

19	0.05937	0.00	0.00	0.00	0.00	1.56E 03	1.61E 03	1.56E 03	1.55E 03	1.57E 03	1.59E 03	1.60E 03	1.61E 03
18	0.05594	0.00	0.00	0.00	0.00	1.48E 03	1.57E 03	1.51E 03	1.52E 03	1.54E 03	1.55E 03	1.56E 03	1.57E 03
17	0.05344	0.00	0.00	0.00	1.57E 03	1.46E 03	1.51E 03	1.48E 03	1.49E 03	1.51E 03	1.53E 03	1.53E 03	1.53E 03
16	0.05078	0.00	0.00	0.00	1.45E 03	1.45E 03	1.44E 03	1.43E 03	1.45E 03	1.48E 03	1.49E 03	1.49E 03	1.49E 03
15	0.04812	0.00	0.00	0.00	1.30E 03	1.40E 03	1.38E 03	1.38E 03	1.42E 03	1.44E 03	1.45E 03	1.45E 03	1.45E 03
14	0.04562	0.00	0.00	1.68E 03	1.29E 03	1.33E 03	1.31E 03	1.33E 03	1.37E 03	1.40E 03	1.41E 03	1.41E 03	1.41E 03
13	0.04328	0.00	0.00	1.51E 03	1.32E 03	1.26E 03	1.25E 03	1.29E 03	1.33E 03	1.36E 03	1.37E 03	1.37E 03	1.36E 03
12	0.04094	0.00	0.00	1.27E 03	1.28E 03	1.20E 03	1.20E 03	1.24E 03	1.29E 03	1.31E 03	1.32E 03	1.32E 03	1.32E 03
11	0.03719	0.00	1.43E 03	1.15E 03	1.16E 03	1.10E 03	1.11E 03	1.16E 03	1.20E 03	1.23E 03	1.24E 03	1.25E 03	1.25E 03
10	0.03437	0.00	1.11E 03	1.12E 03	1.07E 03	1.03E 03	1.05E 03	1.10E 03	1.14E 03	1.16E 03	1.18E 03	1.19E 03	1.20E 03
9	0.03219	0.00	7.84E 02	1.05E 03	1.01E 03	9.79E 02	1.01E 03	1.05E 03	1.08E 03	1.11E 03	1.13E 03	1.15E 03	1.16E 03
8	0.03031	0.00	6.43E 02	9.70E 02	9.64E 02	9.39E 02	9.68E 02	1.00E 03	1.04E 03	1.06E 03	1.09E 03	1.11E 03	1.12E 03
7	0.02687	0.00	6.58E 02	8.63E 02	8.81E 02	8.73E 02	8.91E 02	9.19E 02	9.50E 02	9.81E 02	1.01E 03	1.04E 03	1.06E 03
6	0.02187	0.00	6.08E 02	7.39E 02	7.50E 02	7.62E 02	7.80E 02	8.02E 02	8.30E 02	8.65E 02	9.02E 02	9.39E 02	9.72E 02
5	0.01625	0.00	4.97E 02	6.07E 02	6.41E 02	6.47E 02	6.65E 02	6.85E 02	7.14E 02	7.52E 02	7.97E 02	8.45E 02	8.89E 02
4	0.01062	0.00	3.37E 02	4.79E 02	5.02E 02	5.46E 02	5.72E 02	5.96E 02	6.26E 02	6.67E 02	7.17E 02	7.73E 02	8.26E 02
3	0.00562	0.00	1.17E 02	4.14E 02	4.40E 02	4.85E 02	5.18E 02	5.45E 02	5.76E 02	6.18E 02	6.72E 02	7.31E 02	7.90E 02
2	0.00156	0.00	0.00	3.39E 02	4.12E 02	4.62E 02	4.97E 02	5.25E 02	5.57E 02	6.00E 02	6.55E 02	7.16E 02	7.77E 02
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 0.15786 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127

0 J	Y	21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.65E 03	1.65E 03	1.65E 03	1.65E 03	1.64E 03	1.63E 03	1.62E 03	1.61E 03	1.60E 03	1.59E 03	0.00	0.00
19	0.05937	1.62E 03	1.62E 03	1.62E 03	1.61E 03	1.60E 03	1.59E 03	1.59E 03	1.58E 03	1.57E 03	1.56E 03	0.00	0.00
18	0.05594	1.57E 03	1.56E 03	1.56E 03	1.55E 03	1.54E 03	1.54E 03	1.53E 03	1.52E 03	1.51E 03	1.51E 03	0.00	0.00
17	0.05344	1.53E 03	1.52E 03	1.52E 03	1.51E 03	1.50E 03	1.50E 03	1.49E 03	1.48E 03	1.48E 03	1.47E 03	0.00	0.00
16	0.05078	1.48E 03	1.48E 03	1.47E 03	1.46E 03	1.46E 03	1.45E 03	1.45E 03	1.44E 03	1.43E 03	1.43E 03	0.00	0.00
15	0.04812	1.44E 03	1.43E 03	1.43E 03	1.42E 03	1.41E 03	1.41E 03	1.40E 03	1.40E 03	1.40E 03	1.39E 03	0.00	0.00
14	0.04562	1.40E 03	1.39E 03	1.39E 03	1.38E 03	1.37E 03	1.37E 03	1.37E 03	1.36E 03	1.36E 03	1.36E 03	0.00	0.00
13	0.04328	1.36E 03	1.35E 03	1.35E 03	1.34E 03	1.34E 03	1.34E 03	1.33E 03	1.33E 03	1.33E 03	1.33E 03	0.00	0.00
12	0.04094	1.32E 03	1.31E 03	1.31E 03	1.31E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	0.00	0.00
11	0.03719	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.26E 03	1.26E 03	0.00
10	0.03437	1.20E 03	1.20E 03	1.21E 03	1.21E 03	1.21E 03	1.22E 03	1.22E 03	1.22E 03	1.22E 03	1.22E 03	1.23E 03	0.00
9	0.03219	1.16E 03	1.17E 03	1.17E 03	1.18E 03	1.18E 03	1.19E 03	1.19E 03	1.20E 03	1.20E 03	1.21E 03	1.21E 03	0.00
8	0.03031	1.13E 03	1.14E 03	1.15E 03	1.15E 03	1.16E 03	1.17E 03	1.17E 03	1.18E 03	1.18E 03	1.19E 03	1.19E 03	0.00
7	0.02687	1.08E 03	1.09E 03	1.10E 03	1.11E 03	1.12E 03	1.13E 03	1.14E 03	1.15E 03	1.15E 03	1.16E 03	1.16E 03	0.00
6	0.02187	1.00E 03	1.02E 03	1.04E 03	1.06E 03	1.07E 03	1.08E 03	1.10E 03	1.11E 03	1.11E 03	1.12E 03	1.12E 03	0.00
5	0.01625	9.28E 02	9.61E 02	9.87E 02	1.01E 03	1.03E 03	1.04E 03	1.06E 03	1.07E 03	1.08E 03	1.09E 03	1.09E 03	0.00
4	0.01062	8.74E 02	9.14E 02	9.46E 02	9.72E 02	9.94E 02	1.01E 03	1.03E 03	1.04E 03	1.06E 03	1.07E 03	1.07E 03	0.00
3	0.00562	8.43E 02	8.87E 02	9.23E 02	9.52E 02	9.76E 02	9.96E 02	1.01E 03	1.03E 03	1.04E 03	1.05E 03	1.05E 03	0.00
2	0.00156	8.31E 02	8.77E 02	9.15E 02	9.45E 02	9.69E 02	9.90E 02	1.01E 03	1.02E 03	1.04E 03	1.05E 03	1.05E 03	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-PRESSURE*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-

0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552

0 J	Y	21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	6.25E-02	5.22E-02	9.60E-02	1.06E-01	1.01E-01	9.70E-02	9.97E-02	1.07E-01
19	0.05937	0.00	0.00	0.00	0.00	7.09E-02	5.39E-02	9.49E-02	1.03E-01	9.69E-02	9.17E-02	9.13E-02	9.48E-02
18	0.05594	0.00	0.00	0.00	0.00	9.24E-02	6.05E-02	9.53E-02	9.88E-02	9.09E-02	8.30E-02	7.82E-02	7.67E-02
17	0.05344	0.00	0.00	0.00	-7.79E-05	8.29E-02	7.25E-02	9.70E-02	9.57E-02	8.57E-02	7.54E-02	6.79E-02	6.32E-02
16	0.05078	0.00	0.00	0.00	2.64E-02	6.68E-02	8.24E-02	9.80E-02	9.15E-02	7.88E-02	6.63E-02	5.58E-02	4.85E-02
15	0.04812	0.00	0.00	0.00	5.83E-02	6.26E-02	8.76E-02	9.62E-02	8.56E-02	6.97E-02	5.53E-02	4.21E-02	3.32E-02

13	0.34625	0.00	0.00	1.03E 00	8.64E-01	7.45E-01	7.36E-01	7.88E-01	8.37E-01	8.61E-01	8.64E-01	8.55E-01	8.43E-01
12	0.32750	0.00	0.00	1.07E 00	8.61E-01	7.35E-01	7.42E-01	8.10E-01	8.57E-01	8.73E-01	8.67E-01	8.50E-01	8.31E-01
11	0.29750	0.00	1.42E 00	1.15E 00	8.53E-01	7.22E-01	7.60E-01	8.37E-01	8.74E-01	8.77E-01	8.59E-01	8.31E-01	8.03E-01
10	0.27500	0.00	1.50E 00	1.14E 00	8.15E-01	7.02E-01	7.71E-01	8.41E-01	8.69E-01	8.64E-01	8.40E-01	8.07E-01	7.73E-01
9	0.25750	0.00	1.59E 00	1.13E 00	7.87E-01	6.96E-01	7.72E-01	8.34E-01	8.55E-01	8.46E-01	8.18E-01	7.83E-01	7.46E-01
8	0.24250	2.14E 00	1.69E 00	1.12E 00	7.62E-01	6.92E-01	7.67E-01	8.20E-01	8.36E-01	8.24E-01	7.95E-01	7.58E-01	7.20E-01
7	0.21500	2.14E 00	1.65E 00	1.06E 00	7.23E-01	6.84E-01	7.40E-01	7.76E-01	7.85E-01	7.71E-01	7.41E-01	7.04E-01	6.65E-01
6	0.17500	2.14E 00	1.57E 00	9.54E-01	6.54E-01	6.40E-01	6.62E-01	6.76E-01	6.79E-01	6.66E-01	6.39E-01	6.06E-01	5.69E-01
5	0.13000	2.14E 00	1.43E 00	7.91E-01	5.12E-01	5.32E-01	5.28E-01	5.29E-01	5.28E-01	5.18E-01	4.98E-01	4.72E-01	4.42E-01
4	0.08500	2.14E 00	1.25E 00	5.54E-01	3.89E-01	3.75E-01	3.63E-01	3.58E-01	3.56E-01	3.50E-01	3.37E-01	3.20E-01	2.99E-01
3	0.04500	2.14E 00	9.60E-01	2.07E-01	2.19E-01	2.08E-01	1.98E-01	1.94E-01	1.93E-01	1.90E-01	1.83E-01	1.74E-01	1.62E-01
2	0.01250	2.14E 00	2.67E-01	5.76E-02	6.09E-02	5.77E-02	5.51E-02	5.39E-02	5.35E-02	5.27E-02	5.09E-02	4.83E-02	4.50E-02
1-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015

0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	8.60E-01	9.01E-01	9.24E-01	9.32E-01	9.27E-01	9.12E-01	8.90E-01	8.66E-01	8.41E-01	8.29E-01	0.00	0.00
19	0.47500	8.89E-01	9.26E-01	9.48E-01	9.58E-01	9.58E-01	9.51E-01	9.39E-01	9.25E-01	9.10E-01	8.94E-01	0.00	0.00
18	0.44750	8.89E-01	9.16E-01	9.32E-01	9.38E-01	9.36E-01	9.29E-01	9.19E-01	9.07E-01	8.94E-01	8.79E-01	0.00	0.00
17	0.42750	8.83E-01	9.02E-01	9.12E-01	9.14E-01	9.11E-01	9.03E-01	8.92E-01	8.80E-01	8.67E-01	8.52E-01	0.00	0.00
16	0.40625	8.74E-01	8.85E-01	8.88E-01	8.86E-01	8.79E-01	8.70E-01	8.58E-01	8.45E-01	8.32E-01	8.18E-01	0.00	0.00
15	0.38500	8.62E-01	8.64E-01	8.62E-01	8.55E-01	8.46E-01	8.34E-01	8.21E-01	8.08E-01	7.94E-01	7.80E-01	0.00	0.00
14	0.36500	8.48E-01	8.43E-01	8.35E-01	8.24E-01	8.12E-01	7.99E-01	7.85E-01	7.71E-01	7.57E-01	7.43E-01	0.00	0.00
13	0.34625	8.32E-01	8.20E-01	8.07E-01	7.94E-01	7.79E-01	7.64E-01	7.49E-01	7.35E-01	7.21E-01	7.07E-01	0.00	0.00
12	0.32750	8.13E-01	7.95E-01	7.78E-01	7.61E-01	7.45E-01	7.29E-01	7.13E-01	6.99E-01	6.85E-01	6.71E-01	0.00	0.00
11	0.29750	7.75E-01	7.50E-01	7.28E-01	7.07E-01	6.88E-01	6.71E-01	6.54E-01	6.39E-01	6.25E-01	6.12E-01	0.00	0.00
10	0.27500	7.41E-01	7.12E-01	6.86E-01	6.63E-01	6.43E-01	6.25E-01	6.08E-01	5.93E-01	5.80E-01	5.67E-01	0.00	0.00
9	0.25750	7.12E-01	6.80E-01	6.52E-01	6.28E-01	6.07E-01	5.89E-01	5.72E-01	5.57E-01	5.44E-01	5.32E-01	0.00	0.00
8	0.24250	6.84E-01	6.51E-01	6.22E-01	5.97E-01	5.76E-01	5.57E-01	5.41E-01	5.27E-01	5.13E-01	5.01E-01	0.00	0.00
7	0.21500	6.27E-01	5.93E-01	5.63E-01	5.38E-01	5.17E-01	4.99E-01	4.87E-01	4.69E-01	4.57E-01	4.46E-01	0.00	0.00
6	0.17500	5.33E-01	5.00E-01	4.71E-01	4.47E-01	4.28E-01	4.11E-01	3.97E-01	3.85E-01	3.74E-01	3.64E-01	0.00	0.00
5	0.13000	4.12E-01	3.83E-01	3.59E-01	3.39E-01	3.23E-01	3.09E-01	2.97E-01	2.88E-01	2.79E-01	2.72E-01	0.00	0.00
4	0.08500	2.77E-01	2.57E-01	2.40E-01	2.26E-01	2.14E-01	2.04E-01	1.96E-01	1.90E-01	1.84E-01	1.79E-01	0.00	0.00
3	0.04500	1.50E-01	1.39E-01	1.29E-01	1.21E-01	1.15E-01	1.10E-01	1.05E-01	1.02E-01	9.84E-02	9.57E-02	0.00	0.00
2	0.01250	4.17E-02	3.86E-02	3.59E-02	3.37E-02	3.19E-02	3.05E-02	2.92E-02	2.82E-02	2.73E-02	2.66E-02	0.00	0.00
1-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- - - - - DIMENSIONLESS STREAMLINE COORDS - - - - -

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
0	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363

0 J	Y												
11	1.00000	0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	0.00	2.37E-01	3.12E-01	3.75E-01	4.27E-01	4.79E-01	4.87E-01	4.87E-01	4.87E-01	4.86E-01	4.84E-01	4.83E-01
9	0.80000	0.00	2.23E-01	2.84E-01	3.55E-01	4.16E-01	4.64E-01	4.74E-01	4.75E-01	4.74E-01	4.71E-01	4.69E-01	4.67E-01
8	0.70000	0.00	2.09E-01	2.68E-01	3.44E-01	4.06E-01	4.49E-01	4.63E-01	4.64E-01	4.61E-01	4.58E-01	4.54E-01	4.50E-01
7	0.60000	0.00	1.93E-01	2.50E-01	3.30E-01	3.93E-01	4.37E-01	4.51E-01	4.52E-01	4.49E-01	4.43E-01	4.38E-01	4.32E-01
6	0.50000	0.00	1.77E-01	2.31E-01	3.15E-01	3.81E-01	4.25E-01	4.40E-01	4.40E-01	4.36E-01	4.29E-01	4.21E-01	4.13E-01
5	0.40000	0.00	1.57E-01	2.12E-01	2.99E-01	3.69E-01	4.13E-01	4.29E-01	4.29E-01	4.22E-01	4.13E-01	4.02E-01	3.92E-01
4	0.30000	0.00	1.36E-01	1.91E-01	2.82E-01	3.56E-01	4.01E-01	4.17E-01	4.16E-01	4.08E-01	3.95E-01	3.81E-01	3.68E-01
3	0.20000	0.00	1.10E-01	1.67E-01	2.62E-01	3.42E-01	3.89E-01	4.05E-01	4.03E-01	3.91E-01	3.74E-01	3.57E-01	3.40E-01
2	0.10000	0.00	7.75E-02	1.37E-01	2.37E-01	3.25E-01	3.75E-01	3.92E-01	3.87E-01	3.71E-01	3.49E-01	3.26E-01	3.03E-01
1	0.00000	0.00	0.00	8.62E-02	2.05E-01	3.05E-01	3.60E-01	3.76E-01	3.69E-01	3.45E-01	3.12E-01	2.79E-01	2.40E-01

0	I =	13	14	15	16	17	18	19	20	21	22	23
0	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299

RADIAL POSITION 2R/D

[illegible]


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3 0.00562 -2.87E 00-1.23E 00 7.88E-02 1.05E 00 1.74E 00 2.23E 00 2.55E 00 2.74E 00 2.83E 00 2.85E 00 2.85E 00
2 0.00156 -3.17E 00-1.48E 00-1.29E-01 8.78E-01 1.60E 00 2.10E 00 2.44E 00 2.64E 00 2.73E 00 2.76E 00 2.76E 00
1-0.00156 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0*-**-*-*-*-*-*-*-*-*-*-*-*-*-*-* V VELOCITY *-**-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0 I = 1 2 3 4 5 6 7 8 9 10 11 12
X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552
0 J Y
21 0.06250 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06062 0.00 0.00 0.00 0.00 0.00 1.43E 00 1.07E 00 1.26E-01-1.21E-01-1.24E-01-9.54E-02-7.78E-02-5.71E-02
19 0.05766 0.00 0.00 0.00 0.00 0.00 5.13E 00 2.29E 00 1.82E-01-3.92E-01-4.01E-01-3.19E-01-2.44E-01-1.69E-01
18 0.05469 0.00 0.00 0.00 0.00 0.00 1.05E 01 3.03E 00-3.19E-02-8.28E-01-7.97E-01-6.05E-01-4.37E-01-2.95E-01
17 0.05211 0.00 0.00 0.00 0.00 6.76E 00 1.04E 01 3.10E 00-4.35E-01-1.32E 00-1.18E 00-8.60E-01-6.04E-01-4.06E-01
16 0.04945 0.00 0.00 0.00 0.00 1.33E 01 1.08E 01 3.01E 00-9.24E-01-1.82E 00-1.54E 00-1.09E 00-7.62E-01-5.17E-01
15 0.04687 0.00 0.00 0.00 0.00 2.03E 01 1.10E 01 2.53E 00-1.49E 00-2.23E 00-1.79E 00-1.26E 00-8.93E-01-6.15E-01
14 0.04445 0.00 0.00 9.71E 00 1.90E 01 1.03E 01 1.74E 00-1.98E 00-2.47E 00-1.94E 00-1.38E 00-9.92E-01-6.98E-01
13 0.04211 0.00 0.00 1.73E 01 1.89E 01 9.41E 00 9.95E-01-2.28E 00-2.57E 00-2.00E 00-1.45E 00-1.07E 00-7.66E-01
12 0.03906 0.00 0.00 2.68E 01 1.90E 01 7.86E 00-5.21E-03-2.45E 00-2.53E 00-1.99E 00-1.50E 00-1.14E 00-8.41E-01
11 0.03578 0.00 1.29E 01 2.60E 01 1.78E 01 5.12E 00-7.24E-01-2.25E 00-2.29E 00-1.88E 00-1.48E 00-1.17E 00-8.89E-01
10 0.03328 0.00 2.08E 01 2.68E 01 1.63E 01 3.26E 00-9.23E-01-1.99E 00-2.06E 00-1.76E 00-1.45E 00-1.18E 00-9.09E-01
9 0.03125 0.00 2.75E 01 2.74E 01 1.46E 01 2.07E 00-9.60E-01-1.76E 00-1.85E 00-1.64E 00-1.40E 00-1.17E 00-9.15E-01
8 0.02859 0.00 2.71E 01 2.73E 01 1.21E 01 6.90E-01-9.38E-01-1.44E 00-1.58E 00-1.48E 00-1.33E 00-1.14E 00-9.10E-01
7 0.02437 0.00 2.71E 01 2.59E 01 6.99E 00-5.82E-01-8.20E-01-9.91E-01-1.17E 00-1.22E 00-1.17E 00-1.06E 00-8.69E-01
6 0.01906 0.00 2.75E 01 2.12E 01 6.46E-01-9.09E-01-6.66E-01-6.09E-01-7.46E-01-8.91E-01-9.44E-01-8.93E-01-7.55E-01
5 0.01344 0.00 2.71E 01 1.12E 01-1.81E 00-9.80E-01-5.25E-01-3.64E-01-4.36E-01-5.81E-01-6.70E-01-6.66E-01-5.76E-01
4 0.00812 0.00 2.29E 01 9.47E-01-1.02E 00-6.93E-01-3.50E-01-2.04E-01-2.33E-01-3.32E-01-4.03E-01-4.15E-01-3.64E-01
3 0.00359 0.00 1.22E 01-1.40E 00-5.26E-01-3.29E-01-1.62E-01-8.85E-02-9.77E-02-1.43E-01-1.78E-01-1.86E-01-1.64E-01
2 0.00000 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
1 0.00000 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0 I = 13 14 15 16 17 18 19 20 21 22 23
X = 0.15786 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127
0 J Y
21 0.06250 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
20 0.06062 -3.31E-02-1.45E-02-3.98E-03 5.74E-04 1.84E-03 1.44E-03 1.59E-03 1.49E-03 2.80E-03 1.09E-05 0.00
19 0.05766 -9.87E-02-4.66E-02-1.63E-02-1.56E-03 4.47E-03 5.86E-03 7.59E-03 8.08E-03 8.40E-03-1.26E-05 0.00
18 0.05469 -1.75E-01-8.94E-02-3.83E-02-1.18E-02 5.06E-04 5.24E-03 9.57E-03 1.14E-02 1.18E-02-3.73E-05 0.00
17 0.05211 -2.46E-01-1.32E-01-6.24E-02-2.51E-02-6.53E-03 1.82E-03 8.87E-03 1.21E-02 1.35E-02-4.84E-05 0.00
16 0.04945 -3.20E-01-1.79E-01-9.11E-02-4.23E-02-1.68E-02-4.10E-03 6.12E-03 1.12E-02 1.39E-02-4.82E-05 0.00
15 0.04687 -3.90E-01-2.26E-01-1.21E-01-6.13E-02-2.87E-02-1.14E-02 2.09E-03 9.00E-03 1.35E-02-3.92E-05 0.00
14 0.04445 -4.52E-01-2.69E-01-1.50E-01-8.02E-02-4.09E-02-1.92E-02-2.47E-03 6.29E-03 1.25E-02-2.70E-05 0.00
13 0.04211 -5.06E-01-3.09E-01-1.78E-01-9.87E-02-5.31E-02-2.70E-02-7.26E-03 3.31E-03 1.12E-02-1.60E-05 0.00
12 0.03906 -5.70E-01-3.57E-01-2.12E-01-1.22E-01-6.88E-02-3.72E-02-1.37E-02-8.25E-04 9.16E-03-7.58E-06 0.00
11 0.03578 -6.18E-01-3.97E-01-2.42E-01-1.44E-01-8.34E-02-4.69E-02-2.01E-02-5.08E-03 6.72E-03-1.50E-05 0.00
10 0.03328 -6.42E-01-4.20E-01-2.60E-01-1.57E-01-9.27E-02-5.32E-02-2.43E-02-8.01E-03 4.90E-03-3.08E-05 0.00
9 0.03125 -6.54E-01-4.33E-01-2.72E-01-1
```


0000100	PA 99		0000100
0000200	NF		0000200
0000300	NJ		0000300
0000320	BL %		0000400
0000330	PM PREFIX /	/	0000500
0000335	PM TOP		0000600
0000336	PM MARGIN		0000700
0000340	HM OFF		0000800
0000360	LL 80		0000900
0000370	TS A0 B1		0001000
0000380	BS Y2 Z2		0001100
0000400	C	SUBROUTINE CONTRO	0001200
0000500	C		0001300
0000600	CA*****		0001400
0000700	C		0001500
0000800	C		0001600
0000900	C	A COMPUTER PROGRAM FOR TURBULENT, SWIRLING, RECIRCULATING,	0001700
0001000	C	FLOW IN COMBUSTOR GEOMETRIES	0001800
0001100	C		0001900
0001200	C	VERSION OF APRIL, 1981	0002000
0001300	C		0002100
0001400	C	D L RHODE & D G LILLEY	0002200
0001500	C	MECHANICAL AND AEROSPACE ENGINEERING	0002300
0001600	C	OKLAHOMA STATE UNIVERSITY	0002400
0001700	C	STILLWATER, OK 74078	0002500
0001800	C		0002600
0001900	C		0002700
0002000	CA*****		0002800
0002100	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0		0002900
0002200	C		0003000
0002300		DIMENSION HEDU(9), HEDV(9), HEDW(9), HEDP(9), HEDT(9), HEDK(9),	0003100
0002400		*HEDD(9), HEDM(9), HEDL(9), VANB(7), SWNB(7), HEDSF(9), HEDSL(9),	0003200
0002500		#HEDDU(9), HEDDV(9), HEDDW(9),	0003300
0002600		#HEDDP(9), HEDDK(9), HEDDSL(9), HEDDVS(9)	0003400
0002700		DIMENSION YAXES(10), SYMB L(10)	0003500
0002800		COMMON	0003600
0002900		1/UVEL/RESORU, NSWPU, URFU, DXEPU(48), DXPWU(48), SEWU(48)	0003700
0003000		1/VVEL/RESORV, NSWPV, URFV, DYNPV(24), DYPSV(24), SNSV(24)	0003800
0003100		*WVEL/ RESORW, NSWPW, URFW	0003900
0003200		1/PCOR/RESORM, NSWPP, URFP, DU(48,24), DV(48,24), IPREF, JPREF	0004000
0003300		1/TEN/RESORK, NSWPK, URFK	0004100
0003400		1/TDIS/RESORE, NSWPD, URFE	0004200
0003500		*VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0004300
0003600		*ED(48,24), STF(48,24), YSTLN(48,24), STVAL(24), USTAR(48,24),	
0003700		*VSTAR(48,24), WSTAR(48,24), PSTAR(48,24), TESTAR(48,24), YSTLND(48,24)	
0003800		#, VISTAR(48,24)	
0003900		1/ALL/IT, JT, NI, NJ, NIM1, NJM1, GREAT, JMAX(48), JMAXP1(48)	
0004000		1/GEOM/INDCOS, X(48), Y(24), DXEP(48), DXPW(48), DYNP(24), DYPS(24),	
0004100		1 SNS(24), SEW(48), XU(48), YV(24), R(24), RV(24),	
0004200		# WFN(24), WFS(24), WFE(48), WFW(48), RCV(24), XND(48), XUND(48),	
0004300		#YND(24), YVND(24)	
0004400		COMMON	
0004500		1/FLUPR/URFVIS, VISCOS, DENSIT, PRANDT, DEN(48,24), VIS(48,24)	
0004600		1/KASE T1/ UIN, TEIN, EDIN, FLOWIN, ALAMDA,	

0037100•	URFW=.6	0036800
0037200•	URFK=.7	0036900
0037300•	URFE=.7	0037000
0037400•	URFVIS=.7	0037100
0037500•	IF(ILFS.LT. 3) GO TO 430	0037200
0037600•	425 CONTINUE	0037300
0037700•	C-----INCREASE UNDERRELAXATION FACTORS AS CONVERGENCE NEARS	0037400
0037800•	URFU=.15+(FLOAT(NITER))*((.35-.15)/40.)	0037500
0037900•	IF(URFU.GT. .35) URFU=.35	0037600
0038000•	URFV=.20+(FLOAT(NITER))*((.25-.20)/40.)	0037700
0038100•	IF(URFV.GT. .25) URFV=.25	0037800
0038200•	URFW=.50+(FLOAT(NITER))*((.60-.50)/40.)	0037900
0038300•	IF(URFW.GT. .60) URFW=.60	0038000
0038400•	URFK=.70	0038100
0038500•	URFE=.70	0038200
0038600•	URFVIS=.70	0038300
0038700•	IF((RESORV.LT. .08).AND.(RESORU.LT. .10)) URFU=.40	0038400
0038800•	IF((RESORV.LT. .06).AND.(RESORU.LT. .08)) URFU=.45	0038500
0038900•	IF((RESORK.LT. .10E-1).AND.(RESORE.LT. .10E+10)) URFE=.75	0038600
0039000•	IF((RESORK.LT. .4E-2).AND.(RESORE.LT. .5E+9)) URFE=.80	0038700
0039100•	IF(RESORU.LT. SORMAX) URFU=.20	0038800
0039200•	IF(RESORV.LT. SORMAX) URFV=.20	0038900
0039300•	IF(RESORW.LT. SORMAX) URFW=.25	0039000
0039400•	IF(RESORK.LT. .10E-2) URFK=.60	0039100
0039500•	IF(RESORE.LT. .10E+8) URFE=.55	0039200
0039600•	430 CONTINUE	0039300
0039700•	C-----UPDATE MAIN DEPENDENT VARIABLES	0039400
0039800•	IF(INCALU) CALL CALCU	0039500
0039900•	IF(INCALV) CALL CALCV	0039600
0040000•	IF(INCALP) CALL CALCP	0039700
0040100•	IF(INCALW) CALL CALCW	0039800
0040200•	IF(INCALK) CALL CALCTE	0039900
0040300•	IF(INCald) CALL CALCED	0040000
0040400•	C-----UPDATE FLUID PROPERTIES	0040100
0040500•	IF(INPRO) CALL PROPS	0040200
0040600•	C-----INTERMEDIATE OUTPUT	0040300
0040700•	RESORM=RESORM/FLOWIN	0040400
0040800•	RESORU=RESORU/XMONIN	0040500
0040900•	RESORV=RESORV/XMONIN	0040600
0041000•	RESORW=RESORW/WMONIN	0040700
0041100•	RESORK=RESORK/(.5*FLOWIN*UMEAN*UMEAN)	0040800
0041200•	IF(NITER.NE. IPRINT) GO TO 301	0040900
0041300•	IPRINT=IPRINT+1	0041000
0041400•	WRITE(6,311) NITER,RESORU,RESORV,RESORW,RESORM,RESORK,	0041100
0041500•	*RESORE,U(IMON,JMON),V(IMON,JMON),W(IMON,JMON),P(IMON,NJM1),	0041200
0041600•	*ED(IMON,NJM1)	0041300
0041700•	IF(NITER.NE. JPRINT) GO TO 301	0041400
0041800•	IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)	0041500
0041900•	IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)	0041600
0042000•	IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,W,HEDW)	0041700
0042100•	IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,P,HEDP)	0041800
0042200•	IF(INCald) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)	0041900
0042300•	JPRINT=JPRINT+25	0042000
0042400•	WRITE(6,310) IMON,JMON	0042100

0074900•	1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF	0074600
0075000•	* /VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0074700
0075100•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0074800
0075200•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0074900
0075300•	#,VISTAR(48,24)	0075000
0075400•	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0075100
0075500•	1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0075200
0075600•	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0075300
0075700•	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0075400
0075800•	#YND(24),YVND(24)	0075500
0075900•	COMMON	0075600
0076000•	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0075700
0076100•	1/COEF/API(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0075800
0076200•	1 SP(48,24)	0075900
0076300•	1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,	0076000
0076400•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0076100
0076500•	C	0076200
0076600•	CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1	0076300
0076700•	C	0076400
0076800•	DO 100 I=3,NIM1	0076500
0076900•	DO 101 J=2,NJM1	0076600
0077000•	C-----COMPUTE AREAS AND VOLUME	0076700
0077100•	AREAN=RV(J+1)*SEWU(I)	0076800
0077200•	AREAS=RV(J)*SEWU(I)	0076900
0077300•	AREAEW=RCV(J)*SNS(J)	0077000
0077400•	VOL=RCV(J)*SEWU(I)*SNS(J)	0077100
0077500•	C-----CALCULATE CONVECTION COEFFICIENTS	0077200
0077600•	GN=0.5*(DEN(I,J+1)+DEN(I,J))*V(I,J+1)	0077300
0077700•	GNW=0.5*(DEN(I-1,J)+DEN(I-1,J+1))*V(I-1,J+1)	0077400
0077800•	GS=0.5*(DEN(I,J-1)+DEN(I,J))*V(I,J)	0077500
0077900•	GSW=0.5*(DEN(I-1,J)+DEN(I-1,J-1))*V(I-1,J)	0077600
0078000•	GE=DEN(I,J)*(U(I+1,J)*(1.0-WFE(I))+U(I,J)*WFE(I))	0077700
0078100•	GW=DEN(I-1,J)*(U(I-1,J)*(1.0-WFW(I))+U(I,J)*WFW(I))	0077800
0078200•	CN=0.5*(GN+GNW)*AREAN	0077900
0078300•	CS=0.5*(GS+GSW)*AREAS	0078000
0078400•	CE=GE*AREAEW	0078100
0078500•	CW=GW*AREAEW	0078200
0078600•	C-----CALCULATE DIFFUSION COEFFICIENTS	0078300
0078700•	VISN=0.25*(VIS(I,J)+VIS(I,J+1)+VIS(I-1,J)+VIS(I-1,J+1))	0078400
0078800•	VISS=0.25*(VIS(I,J)+VIS(I,J-1)+VIS(I-1,J)+VIS(I-1,J-1))	0078500
0078900•	DN=VISN*AREAN/DYNP(J)	0078600
0079000•	DS=VISS*AREAS/DYPS(J)	0078700
0079100•	DE=VIS(I,J)*AREAEW/DXEPU(I)	0078800
0079200•	DW=VIS(I-1,J)*AREAEW/DXPWU(I)	0078900
0079300•	C-----CALCULATE COEFFICIENTS OF SOURCE TERMS	0079000
0079400•	SMP=CN-CS+CE-CW	0079100
0079500•	CP=AMAX1(0.0,SMP)	0079200
0079600•	CPO=CP	0079300
0079700•	C-----ASSEMBLE MAIN COEFFICIENTS	0079400
0079800•	AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN	0079500
0079900•	AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS	0079600
0080000•	DE=AMAX1(DE,-WFE(I)*CE,(1.0-WFE(I))*CE)	0079700
0080100•	DW=AMAX1(DW,WFW(I)*CW,-(1.0-WFW(I))*CW)	0079800
0080200•	AE(I,J)=DE-(1.0-WFE(I))*CE	0079900

0112700•	AS(I,J)=DENS*AREAS*DV(I,J)	0112400
0112800•	AE(I,J)=DENE*AREAWE*DU(I+1,J)	0112500
0112900•	AW(I,J)=DENW*AREAWE*DU(I,J)	0112600
0113000•	C-----CALCULATE SOURCE TERMS	0112700
0113100•	CN=DENN*V(I,J+1)*AREAN	0112800
0113200•	CS=DENS*V(I,J)*AREAS	0112900
0113300•	CE=DENE*U(I+1,J)*AREAWE	0113000
0113400•	CW=DENW*U(I,J)*AREAWE	0113100
0113500•	SMP=CN-CS+CE-CW	0113200
0113600•	SP(I,J)=0.0	0113300
0113700•	SU(I,J)=-SMP	0113400
0113800•	C-----COMPUTE SUM OF ABSOLUTE MASS SOURCES	0113500
0113900•	RESORM=RESORM+ABS(SMP)	0113600
0114000•	101 CONTINUE	0113700
0114100•	100 CONTINUE	0113800
0114200•	C	0113900
0114300•	CHAPTER 2 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 2	0114000
0114400•	C	0114100
0114500•	CALL PROMOD (4)	0114200
0114600•	C	0114300
0114700•	CHAPTER 3 3 3 3 3 FINAL COEFFICIENT ASSEMBLY 3 3 3 3 3 3 3	0114400
0114800•	C	0114500
0114900•	DO 300 I=2,NIM1	0114600
0115000•	DO 301 J=2,NJM1	0114700
0115100•	301 AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0114800
0115200•	300 CONTINUE	0114900
0115300•	C	0115000
0115400•	CHAPTER 4 4 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4	0115100
0115500•	C	0115200
0115600•	DO 400 N=1,NSWPP	0115300
0115700•	400 CALL LISOLV(2,2,NI,JMAX,IT,JT,PP,4)	0115400
0115800•	C	0115500
0115900•	CHAPTER 5 5 5 5 CORRECT VELOCITIES AND PRESSURE 5 5 5 5 5	0115600
0116000•	C	0115700
0116100•	C-----VELOCITIES	0115800
0116200•	DO 503 I=2,NIM1	0115900
0116300•	JJ=JMAX(I)	0116000
0116400•	DO 501 J=3,JJ	0116100
0116500•	V(I,J)=V(I,J)+DV(I,J)*(PP(I,J-1)-PP(I,J))	0116200
0116600•	501 CONTINUE	0116300
0116700•	JJ=JMAX(I-1)	0116400
0116800•	DO 502 J=2,JJ	0116500
0116900•	IF(I.NE.2) U(I,J)=U(I,J)+DU(I,J)*(PP(I-1,J)-PP(I,J))	0116600
0117000•	502 CONTINUE	0116700
0117100•	503 CONTINUE	0116800
0117200•	C-----PRESSURES (WITH PROVISION FOR UNDER-RELAXATION)	0116900
0117300•	PPREF=PP(IPREF,JPREF)	0117000
0117400•	DO 506 I=2,NIM1	0117100
0117500•	JJ=JMAX(I)	0117200
0117600•	DO 508 J=2,JJ	0117300
0117700•	P(I,J)=P(I,J)+URFP*(PP(I,J)-PPREF)	0117400
0117800•	C-----PP IS ZEROED AT TOP OF CHAPTER 3, MAIN	0117500
0117900•	508 CONTINUE	0117600
0118000•	506 CONTINUE	0117700

0150500•	1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,	0150200
0150600•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0150300
0150700•	1/SUSP/SUKD(48,24),SPKD(48,24)	0150400
0150800•	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0150500
0150900•	1 SP(48,24)	0150600
0151000•	1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE	0150700
0151100•	1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)	0150800
0151200•	IF(INCHAP.EQ. 2) GO TO 1150	0150900
0151300•	IF(JSTEP.EQ. NJM1) GO TO 1150	0151000
0151400•	C-----OUT OF RANGE VALUES	0151100
0151500•	DO 1100 I=2,NI	0151200
0151600•	IF(JMAX(I).EQ. NJM1) GO TO 1150	0151300
0151700•	JJ=JMAXP1(I)	0151400
0151800•	DO 1100 J=JJ,NJM1	0151500
0151900•	1100 SP(I,J)=-GREAT	0151600
0152000•	1150 CONTINUE	0151700
0152100•	GO TO (1,2,3,4,5,6,7,8),NCHAP	0151800
0152200•	C	0151900
0152300•	C	0152000
0152400•	C	0152100
0152500•	CHAPTER 1 1 1 1 1 1 1 1 PROPERTIES 1 1 1 1 1 1 1 1	0152200
0152600•	C	0152300
0152700•	1 CONTINUE	0152400
0152800•	C-----NO MODIFICATIONS FOR THIS PROBLEM	0152500
0152900•	RETURN	0152600
0153000•	C	0152700
0153100•	CHAPTER 2 2 2 2 2 2 2 2 U MOMENTUM 2 2 2 2 2 2 2 2	0152800
0153200•	C	0152900
0153300•	2 CONTINUE	0153000
0153400•	C-----OUT OF RANGE VALUES	0153100
0153500•	IF(JSTEP.EQ. NJM1) GO TO 202	0153200
0153600•	DO 200 I=3,NI	0153300
0153700•	IF(JMAX(I-1).EQ. NJM1) GO TO 202	0153400
0153800•	JJ=JMAXP1(I-1)	0153500
0153900•	DO 200 J=JJ,NJM1	0153600
0154000•	SP(I,J)=-GREAT	0153700
0154100•	200 CONTINUE	0153800
0154200•	202 CONTINUE	0153900
0154300•	C-----TOP WALL	0154000
0154400•	CDTERM=CMU*0.25	0154100
0154500•	DO 210 I=3,NIM1	0154200
0154600•	J=JMAX(I-1)	0154300
0154700•	YP=YV(J+1)-Y(J)	0154400
0154800•	SQRTK=SQRT(0.5*(TE(I,J)+TE(I-1,J)))	0154500
0154900•	DENU=0.5*(DEN(I,J)+DEN(I-1,J))	0154600
0155000•	YPLUSA=0.5*(YPLUSN(I)+YPLUSN(I-1))	0154700
0155100•	IF(YPLUSA.LE.11.63) GO TO 211	0154800
0155200•	TMULT=DENU*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSA)	0154900
0155300•	GO TO 212	0155000
0155400•	211 TMULT=VISCOS/YP	0155100
0155500•	212 CONTINUE	0155200
0155600•	205 SP(I,J)=SP(I,J)-TMULT*SEWU(I)*RV(J+1)	0155300
0155700•	IF(JMAX(I-1).NE. JMAX(I)) SP(I,J)=SP(I,J)/2.	0155400
0155800•	210 AN(I,J)=0.	0155500

0188300•	730 CONTINUE	0188000
0188400•	DO 740 I=1,NIM1	0188100
0188500•	XUDPLT(I)=XUND(I+1)	0188200
0188600•	740 CONTINUE	0188300
0188700•	745 NPTS=NIM1	0188400
0188800•	RETURN	0188500
0188900•	END	0188600
0189000•	C	0188700
0189100•	C	0188800
0189200•	SUBROUTINE PLOT (X,IDIM,IMAX,XAXIS,Y,JDIM,JMAX,YAXES,SYMB L,LA)	0188900
0189300•	CA*****	0189000
0189400•	C	0189100
0189500•	C SUBROUTINE FOR PLOTTING J CURVES OF Y(J,I) AGAINST X(I).	0189200
0189600•	C	0189300
0189700•	C X AND Y ARE ASSUMED TO BE IN ANY RANGE EXCEPT THAT NEGATIVE VALUES *	0189400
0189800•	C ARE PLOTTED AS ZERO. *	0189500
0189900•	C X AND Y ARE SCALED TO THE RANGE 0. TO 1. BY DIVISION BY THE MAXIMA, *	0189600
0190000•	C WHICH ARE ALSO PRINTED.	0189700
0190100•	C IDIM IS THE VARIABLE DIMENSION FOR X.	0189800
0190200•	C IMAX IS THE NUMBER OF X VALUES.	0189900
0190300•	C XAXIS STORES THE NAME OF THE X-AXIS.	0190000
0190400•	C JDIM IS THE VARIABLE DIMENSION FOR Y.	0190100
0190500•	C JMAX IS THE NUMBER OF CURVES TO BE PLOTTED, (UP TO 10).	0190200
0190600•	C THE ARRAY YAXES(J) STORES THE NAMES OF THE CURVES.	0190300
0190700•	C THE ARRAY SYMBOL(J) STORES THE SINGLE CHARACTERS USED FOR PLOTTING. *	0190400
0190800•	C	0190500
0190900•	CA*****	0190600
0191000•	DIMENSION X(IDIM),Y(JDIM,IDIM),YAXES(JDIM),SYMB L(JDIM),	0190700
0191100•	1 A(101),YMAX(10)	0190800
0191200•	DATA DOT,CROSS,BLANK/1H.,1H+,1H /	0190900
0191300•	C-----SCALING X ARRAY TO THE RANGE 0 TO 50	0191000
0191400•	XMAX=1.E-30	0191100
0191500•	DO 1 I=1,IMAX	0191200
0191600•	IF(X(I).GT.XMAX) XMAX=X(I)	0191300
0191700•	1 CONTINUE	0191400
0191800•	DO 2 I=1,IMAX	0191500
0191900•	X(I)=X(I)/XMAX*50.	0191600
0192000•	IF(X(I).LT.0.) X(I)=0.	0191700
0192100•	2 CONTINUE	0191800
0192200•	C-----SCALING Y ARRAY TO THE RANGE 0 TO 100	0191900
0192300•	DO 3 J=1,JMAX	0192000
0192400•	YMAX(J)=1.E-30	0192100
0192500•	DO 4 I=1,IMAX	0192200
0192600•	IF(Y(J,I).GT.YMAX(J)) YMAX(J)=Y(J,I)	0192300
0192700•	4 CONTINUE	0192400
0192800•	DO 3 I=1,IMAX	0192500
0192900•	C NO Y SCALING	0192600
0193000•	Y(J,I)=Y(J,I)*100.0	0192700
0193100•	IF(LA.EQ.1) Y(J,I)=0.02*Y(J,I)	0192800
0193200•	IF(Y(J,I).LT.0.) Y(J,I)=0.	0192900
0193300•	3 CONTINUE	0193000
0193400•	C-----IDENTIFYING THE VARIOUS CURVES TO BE PLOTTED	0193100
0193500•	WRITE(6,103) XAXIS	0193200
0193600•	WRITE(6,100) (YAXES(I),I=1,JMAX)	0193300

0004700•	2	RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0004400
0004800•	1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE		0004500
0004900•	1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)		0004600
0005000•	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SUI(48,24),		0004700
0005100•	1	SP(48,24)	0004800
0005200•	1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT		0004900
0005300•	LOGICAL INCALU,INCALV,INCALW,INCALP,INPRO,INCALK,INCALD,INCALM,		0005000
0005400•	*INCALA,INCALB,INCALS,INPLOT,IWRITE,NONDIM,IREAD,INLET,		0005100
0005500•	*INITAL,IFINE		0005200
0005600•	C-----ALL PRIMARY USER INPUTS ARE LOCATED HERE		0005300
0005700•	DATA VANB /0.,45.,55.,60.,65.,68.,70./		0005400
0005800•	#,SWNB/0.,.5,1.0,1.25,1.50,1.75,2.0/		0005500
0005900•	DATA XAXIS /3HXI /		0005600
0006000•	DATA YAXES /3H 00,3H 02,3H 04,3H 06,3H 08,3H 10,		0005700
0006100•	#3H 06,3H 07,3H 08,3H 09/		0005800
0006200•	DATA SYMB L /1H0,1H2,1H4,1H6,1H8,1H1,1H6,1H7,1H8,1H9/		0005900
0006300•	C-----DELETE UNDERFLOW ERROR MESSAGES, CALL TRAPS WHEN USING WATFIV		0006000
0006400•	C-----CALL TRAPS(1,1,4000)		0006100
0006500•	CALL ERRSET(208,256,-1,1,0,0)		0006200
0006600•	C-----SET INPLOT=.TRUE. ONLY FOR STREAMLINE LINE-PRINTER PLOT		0006300
0006700•	INPLOT=.TRUE.		0006400
0006800•	C-----SET IWRITE=.TRUE. ONLY FOR WRITING SOLN. ON DATA FILES		0006500
0006900•	IWRITE=.FALSE.		0006600
0007000•	C-----SET NONDIM=.TRUE. ONLY FOR PRINTING DIMENSIONLESS SOLN.		0006700
0007100•	NONDIM=.TRUE.		0006800
0007200•	C-----SET IREAD=.TRUE. ONLY FOR READING INITIAL GUESS OF SOLN.		0006900
0007300•	C-----FROM DATA FILES		0007000
0007400•	IREAD=.FALSE.		0007100
0007500•	C-----SET INITAL=.TRUE. ONLY FOR PRINTING INITIAL GUESS OF SOLN.		0007200
0007600•	INITAL=.TRUE.		0007300
0007700•	C-----SET IFINE=.TRUE. ONLY FOR FINE GRID IN X-DIRECTION		0007400
0007800•	IFINE=.FALSE.		0007500
0007900•	IF(.NOT. IREAD) GO TO 150		0007600
0008000•	READ(12) X		0007700
0008100•	READ(12) Y		0007800
0008200•	150 CONTINUE		0007900
0008300•	NSTLN=11		0008000
0008400•	NPLTLN=6		0008100
0008500•	MAXLN=10		0008200
0008600•	NITER=0		0008300
0008700•	JPRINT=NITER+300		0008400
0008800•	IPRINT=NITER+1		0008500
0008900•	LFS=1		0008600
0009000•	LFSMAX=7		0008700
0009100•	NSBR=0		0008800
0009200•	MAXIT=NITER+200		0008900
0009300•	C-----SEE STATEMENT 304 FOR MAXIT SPEC. FOR FURTHER SWIRL CASES		0009000
0009400•	DENSIT=1.211		0009100
0009500•	IT=48		0009200
0009600•	JT=24		0009300
0009700•	GREAT=1.E30		0009400
0009800•	NSWPU=4		0009500
0009900•	NSWPV=3		0009600
0010000•	NSWPW=3		0009700

0042500•	301 CONTINUE	0042200
0042600•	C-----TERMINATION TESTS	0042300
0042700•	SORCE=AMAX1(RESORM,RESORU,RESORV,RESORW,RESORK)	0042400
0042800•	IF(NITER.GE.MAXIT) GO TO 302	0042500
0042900•	303 IF(NITER.GE.150.AND.SORCE.GE.3.0) GO TO 302	0042600
0043000•	IF(SORCE.GT.SORMAX.OR.NITER.LT.20) GO TO 300	0042700
0043100•	302 CONTINUE	0042800
0043200•	IF(NITER.GE.150.AND.SORCE.GE.3.0) WRITE(6,960)	0042900
0043300•	C	0043000
0043400•	CHAPTER 4 4 4 4 4 4 FINAL OPERATIONS AND OUTPUT 4 4 4 4 4 4	0043100
0043500•	C	0043200
0043600•	440 CONTINUE	0043300
0043700•	C-----NONDIMENSIONALIZE PROBLEM SOLN.	0043400
0043800•	IF(.NOT.NONDIM) GO TO 700	0043500
0043900•	DO 600 I=1,NI	0043600
0044000•	DO 600 J=1,NJ	0043700
0044100•	USTAR(I,J)=U(I,J)/UIN	0043800
0044200•	VSTAR(I,J)=V(I,J)/UIN	0043900
0044300•	WSTAR(I,J)=W(I,J)/UIN	0044000
0044400•	PSTAR(I,J)=P(I,J)/(DENSIT*(UIN**2)/2.)	0044100
0044500•	TESTAR(I,J)=TE(I,J)/(UIN*UIN)	0044200
0044600•	SP(I,J)=0.0	0044300
0044700•	IF(ED(I,J).GT.1.E-15) SP(I,J)=TE(I,J)**1.5/ED(I,J)/RLARGE	0044400
0044800•	VISTAR(I,J)=VIS(I,J)/VISCOS	0044500
0044900•	600 CONTINUE	0044600
0045000•	700 CONTINUE	0044700
0045100•	IF(INCALS) CALL STRMFN	0044800
0045200•	WRITE(6,312)	0044900
0045300•	WRITE(6,410) LFS,NSBR,SWNB(LFS),VANB(LFS),SWRLNO,UMEAN,FLOWIN	0045000
0045400•	IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)	0045100
0045500•	IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)	0045200
0045600•	IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,W,HEDW)	0045300
0045700•	IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,P,HEDP)	0045400
0045800•	IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,PP,HEDP)	0045500
0045900•	IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,TE,HEDK)	0045600
0046000•	IF(INCALT) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)	0045700
0046100•	IF(INCALS) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,STFN,HEDSF)	0045800
0046200•	IF(INCALS) CALL PRINT(1,1,NI,NJ,IT,JT,XU,STVAL,YSTLN,HEDSL)	0045900
0046300•	IF(.NOT.NONDIM) GO TO 750	0046000
0046400•	IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XUND,YND,USTAR,HEDDU)	0046100
0046500•	IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YVND,VSTAR,HEDDV)	0046200
0046600•	IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,WSTAR,HEDDW)	0046300
0046700•	IF(INCALS) CALL PRINT(1,1,NI,NJ,IT,JT,XUND,STVAL,YSTLND,HEDDSL)	0046400
0046800•	IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,PSTAR,HEDDP)	0046500
0046900•	IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,TESTAR,HEDDK)	0046600
0047000•	IF(INCALK) CALL PRINT(2,2,NI,NJ,IT,JT,X,Y,SP,HEDL)	0046700
0047100•	IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,VISTAR,HEDDVS)	0046800
0047200•	750 CONTINUE	0046900
0047300•	IF(.NOT.IWRITE) GO TO 702	0047000
0047400•	WRITE(11) U	0047100
0047500•	WRITE(11) V	0047200
0047600•	WRITE(11) W	0047300
0047700•	WRITE(11) P	0047400
0047800•	WRITE(11) TE	0047500

0080300•	AW(I,J)=DW+(1.-WFW(I))*CW	0080000
0080400•	DU(I,J)=AREA*W	0080100
0080500•	DUDXE=(U(I+1,J)-U(I,J))/DXEPU(I)	0080200
0080600•	DUDXW=(U(I,J)-U(I-1,J))/DXPWU(I)	0080300
0080700•	SORCE1=(DUDXE*VIS(I,J)-DUDXW*VIS(I-1,J))/SEWU(I)	0080400
0080800•	DVDXN=(V(I,J+1)-V(I-1,J+1))/SEWU(I)	0080500
0080900•	DVDXS=(V(I,J)-V(I-1,J))/SEWU(I)	0080600
0081000•	SORCE2=(RV(J+1)*VISN*DVDXN-RV(J)*VISS*DVDXS)/(RCV(J)*DYNPV(J))	0080700
0081100•	SU(I,J)=CPO*U(I,J)+DU(I,J)*(P(I-1,J)-P(I,J))	0080800
0081200•	SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL	0080900
0081300•	SP(I,J)=-CP	0081000
0081400•	101 CONTINUE	0081100
0081500•	100 CONTINUE	0081200
0081600•	C	0081300
0081700•	CHAPTER 2 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 2	0081400
0081800•	C	0081500
0081900•	CALL PROMOD (2)	0081600
0082000•	C	0081700
0082100•	CHAPTER 3 FINAL COEFF. ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3 3	0081800
0082200•	C	0081900
0082300•	RESORU=0.0	0082000
0082400•	DO 300 I=3,NIM1	0082100
0082500•	DO 301 J=2,NJM1	0082200
0082600•	AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0082300
0082700•	DU(I,J)=DU(I,J)/AP(I,J)	0082400
0082800•	RESOR=AN(I,J)*U(I,J+1)+AS(I,J)*U(I,J-1)+AE(I,J)*U(I+1,J)	0082500
0082900•	1 +AW(I,J)*U(I-1,J)-AP(I,J)*U(I,J)+SU(I,J)	0082600
0083000•	VOL=RCV(J)*SEWU(I)*SNS(J)	0082700
0083100•	SORVOL=GREAT*VOL	0082800
0083200•	IF(-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL	0082900
0083300•	RESORU=RESORU+ABS(RESOR)	0083000
0083400•	C-----UNDER-RELAXATION	0083100
0083500•	AP(I,J)=AP(I,J)/URFU	0083200
0083600•	SU(I,J)=SU(I,J)+(1.-URFU)*AP(I,J)*U(I,J)	0083300
0083700•	DU(I,J)=DU(I,J)*URFU	0083400
0083800•	301 CONTINUE	0083500
0083900•	300 CONTINUE	0083600
0084000•	C	0083700
0084100•	CHAPTER 4 4 4 SOLUTION OF DIFFERENCE EQUATION 4 4 4 4 4 4 4	0083800
0084200•	C	0083900
0084300•	DO 400 N=1,NSWPU	0084000
0084400•	400 CALL LISOLV(3,2,N1,JMAX,IT,JT,U,2)	0084100
0084500•	RETURN	0084200
0084600•	END	0084300
0084700•	C	0084400
0084800•	C-----	0084500
0084900•	C	0084600
0085000•	SUBROUTINE CALCV	0084700
0085100•	CA*****	0084800
0085200•	C	0084900
0085300•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0	0085000
0085400•	C	0085100
0085500•	COMMON	0085200
0085600•	1/VEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)	0085300

0118100•	RETURN	0117800
0118200•	END	0117900
0118300•	C	0118000
0118400•	C-----	0118100
0118500•	C	0118200
0118600•	SUBROUTINE CALCTE	0118300
0118700•	CA*****	0118400
0118800•	C	0118500
0118900•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0	0118600
0119000•	C	0118700
0119100•	COMMON	0118800
0119200•	1/TEN/RESORK,NSWPK,URFK	0118900
0119300•	*/VAR/UI(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0119000
0119400•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0119100
0119500•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0119200
0119600•	#,VISTAR(48,24)	0119300
0119700•	1/ALL/IT, JT, NI, NJ, NIM1, NJM1, GREAT, JMAX(48), JMAXP1(48)	0119400
0119800•	1/GEOM/INDCOS, X(48), Y(24), DXP(48), DXPW(48), DYNP(24), DYPS(24),	0119500
0119900•	1 SNS(24), SEW(48), XU(48), YV(24), R(24), RV(24),	0119600
0120000•	# WFN(24), WFS(24), WFE(48), WFW(48), RCV(24), XND(48), XUND(48),	0119700
0120100•	#YND(24), YVND(24)	0119800
0120200•	COMMON	0119900
0120300•	1/FLUPR/URFVIS, VISCOS, DENSIT, PRANDT, DEN(48,24), VIS(48,24)	0120000
0120400•	1/COEF/AP(48,24), AN(48,24), AS(48,24), AE(48,24), AW(48,24), SU(48,24),	0120100
0120500•	1 SP(48,24)	0120200
0120600•	1/TURB/GEN(48,24), CD, CMU, C1, C2, CAPPA, ELOG, PRED, PRTE	0120300
0120700•	1/WALLF/YPLUSN(48), XPLUSW(24), TAUN(48), TAUW(24)	0120400
0120800•	1/KASE T1/UN, TEIN, EDIN, FLOWIN, ALAMDA,	0120500
0120900•	2 RSMALL, RLARGE, AL1, AL2, JSTEP, ISTEP, JSTP1, JSTM1, ISTEP1, ISTM1	0120600
0121000•	1/SUSP/SUKD(48,24), SPKD(48,24)	0120700
0121100•	C	0120800
0121200•	CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1	0120900
0121300•	C	0121000
0121400•	PRTE=1.0	0121100
0121500•	DO 100 I=2,NIM1	0121200
0121600•	DO 101 J=2,NJM1	0121300
0121700•	C-----COMPUTE AREAS AND VOLUME	0121400
0121800•	AREAN=RV(J+1)*SEW(I)	0121500
0121900•	AREAS=RV(J)*SEW(I)	0121600
0122000•	AREAEW=RCV(J)*SNS(J)	0121700
0122100•	VOL=RCV(J)*SNS(J)*SEW(I)	0121800
0122200•	C-----CALCULATE CONVECTION COEFFICIENTS	0121900
0122300•	GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)	0122000
0122400•	GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)	0122100
0122500•	GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)	0122200
0122600•	GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)	0122300
0122700•	CN=GN*AREAN	0122400
0122800•	CS=GS*AREAS	0122500
0122900•	CE=GE*AREAEW	0122600
0123000•	CW=GW*AREAEW	0122700
0123100•	C-----CALCULATE DIFFUSION COEFFICIENTS	0122800
0123200•	GAMN=0.5*(VIS(I,J)+VIS(I,J+1))/PRTE	0122900
0123300•	GAMS=0.5*(VIS(I,J)+VIS(I,J-1))/PRTE	0123000
0123400•	GAME=0.5*(VIS(I,J)+VIS(I+1,J))/PRTE	0123100

0155900•	C-----SIDE WALL	0155600
0156000•	IF(IJSTEP.EQ.NJM1) GO TO 214	0155700
0156100•	DO 225 I=3,NIM1	0155800
0156200•	IF(JMAX(I-2).GE.JMAX(I-1)) GO TO 225	0155900
0156300•	JJ=JMAXP1(I-2)	0156000
0156400•	JI=JMAX(I-1)	0156100
0156500•	DO 220 J=JJ,JI	0156200
0156600•	AW(I,J)=0.	0156300
0156700•	220 CONTINUE	0156400
0156800•	225 CONTINUE	0156500
0156900•	C-----SYMMETRY AXIS	0156600
0157000•	214 CONTINUE	0156700
0157100•	DO 203 I=1,NI	0156800
0157200•	203 AS(I,2)=0.	0156900
0157300•	C-----OUTLET	0157000
0157400•	ARDENT=0.0	0157100
0157500•	FLOW=0.0	0157200
0157600•	DO 209 J=2,NJM1	0157300
0157700•	ARDEN=0.50*(DEN(NIM1,J)+DEN(NIM1-1,J))*RCV(J)*SNS(J)	0157400
0157800•	ARDENT=ARDENT+ARDEN	0157500
0157900•	209 FLOW=FLOW+ARDEN*U(NIM1,J)	0157600
0158000•	UINC=(FLOWIN-FLOW)/ARDENT	0157700
0158100•	DO 215 J=2,NJM1	0157800
0158200•	215 U(NI,J)=U(NIM1,J)+UINC	0157900
0158300•	RETURN	0158000
0158400•	C	0158100
0158500•	CHAPTER 3 3 3 3 3 3 3 3 V MOMENTUM 3 3 3 3 3 3 3 3	0158200
0158600•	C	0158300
0158700•	3 CONTINUE	0158400
0158800•	C-----SIDE WALL	0158500
0158900•	IF(IJSTEP.EQ.NJM1) GO TO 314	0158600
0159000•	CDTERM=CMU*0.25	0158700
0159100•	DO 325 I=2,NIM1	0158800
0159200•	IF(JMAX(I-1).GE.JMAX(I)) GO TO 325	0158900
0159300•	JJ=JMAXP1(I-1)	0159000
0159400•	JI=JMAX(I)	0159100
0159500•	DO 320 J=JJ,JI	0159200
0159600•	XP=X(I)-XU(I)	0159300
0159700•	SQRTK=SQRT(0.5*(TE(I,J)+TE(I,J-1)))	0159400
0159800•	DENV=0.5*(DEN(I,J)+DEN(I,J-1))	0159500
0159900•	XPLUSA=0.5*(XPLUSW(J)+XPLUSW(J-1))	0159600
0160000•	IF(XPLUSA.LE.11.63) GO TO 311	0159700
0160100•	TMULT=DENV*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSA)	0159800
0160200•	GO TO 312	0159900
0160300•	311 TMULT=VISCOS/XP	0160000
0160400•	312 CONTINUE	0160100
0160500•	305 SP(I,J)=SP(I,J)-TMULT*SNSV(J)*RV(J)	0160200
0160600•	IF(J.EQ.JMAXP1(I-1)) SP(I,J)=SP(I,J)/2.	0160300
0160700•	310 AW(I,J)=0.0	0160400
0160800•	320 CONTINUE	0160500
0160900•	325 CONTINUE	0160600
0161000•	C-----TOP WALL	0160700
0161100•	314 CONTINUE	0160800
0161200•	DO 313 I=2,NIM1	0160900

0193700•	WRITE(6,106) (SYMB L(I),I=1,JMAX)	0193400
0193800•	WRITE(6,102) (YMAX(I),I=1,JMAX)	0193500
0193900•	DO 5 I=1,11	0193600
0194000•	5 A(I)=0.1* (I-1)	0193700
0194100•	IF(LA.EQ.1) WRITE(6,120)	0193800
0194200•	IF(LA.EQ.0) WRITE(6,115)	0193900
0194300•	WRITE(6,101) (A(I),I=1,11)	0194000
0194400•	C-----MAIN LOOP. EACH PASS PRODUCES AN X-CONSTANT LINE.	0194100
0194500•	DO 40 II=1,51	0194200
0194600•	I=II	0194300
0194700•	IF(I.EQ.1.OR.I.EQ.51) GO TO 32	0194400
0194800•	GO TO 33	0194500
0194900•	C-----ALLOCATE . OR + AS MARKER ON THE Y-AXIS	0194600
0195000•	32 DO 30 K=1,101	0194700
0195100•	30 A(K)=DOT	0194800
0195200•	DO 31 K=11,101,10	0194900
0195300•	31 A(K)=CROSS	0195000
0195400•	C-----ALLOCATE . OR + MARK ON THE X-AXIS, ALSO THE APPROPRIATE	0195100
0195500•	C----- X VALUE	0195200
0195600•	33 A(11)=DOT	0195300
0195700•	A(101)=DOT	0195400
0195800•	K=I-1	0195500
0195900•	46 K=K-5	0195600
0196000•	IF(K)48,47,46	0195700
0196100•	47 A(11)=CROSS	0195800
0196200•	A(101)=CROSS	0195900
0196300•	48 XL=0.02* (I-1)	0196000
0196400•	C-----CHECK IF ANY Y(X(I)) VALUE LIES ON THIS X-CONSTANT LINE	0196100
0196500•	C-----IF YES GO TO 41, OTHERWISE GO TO 42	0196200
0196600•	DO 43 K=1,IMAX	0196300
0196700•	IFIX=X(K)+1.5	0196400
0196800•	IF(IFIX-I)43,41,43	0196500
0196900•	C-----LOCATE Y(X(I))	0196600
0197000•	41 DO 44 J=1,JMAX	0196700
0197100•	NY=Y(J,K)+1.5	0196800
0197200•	A(NY)=SYMB L(J)	0196900
0197300•	44 CONTINUE	0197000
0197400•	GO TO 42	0197100
0197500•	43 CONTINUE	0197200
0197600•	C-----PRINT X-CONSTANT LINE	0197300
0197700•	42 CONTINUE	0197400
0197800•	IF(LA.EQ.1) GO TO 51	0197500
0197900•	WRITE(6,105) XL,(A(K),K=1,101),XL	0197600
0198000•	GO TO 52	0197700
0198100•	51 WRITE(6,107) XL,(A(K),K=1,101),XL	0197800
0198200•	52 CONTINUE	0197900
0198300•	C-----PUTTING BLANKS INTO X-CONSTANT LINE	0198000
0198400•	DO 49 K=1,101	0198100
0198500•	49 A(K)=BLANK	0198200
0198600•	40 CONTINUE	0198300
0198700•	DO 50 I=1,11	0198400
0198800•	50 A(I)=.1* (I-1)	0198500
0198900•	WRITE(6,104) (A(I),I=1,11)	0198600
0199000•	WRITE(6,130)	0198700

0010100•	NSWPP=5	0009800
0010200•	NSWPK=3	0009900
0010300•	NSWPD=3	0010000
0010400•	READ(5,10) HEDU,HEDV,HEDW,HEDP,HEDT,HEDK,HEDD,HEDM,HEDL,	0010100
0010500•	\$HEDSF,HEDSL,HEDDU,HEDDV,HEDDW,HEDDP,HEDDK,HEDDSL,HEDDVS	0010200
0010600•	010 FORMAT(9A4)	0010300
0010700•	C	0010400
0010800•	CHAPTER 1 1 1 1 1 PARAMETERS AND CONTROL INDICES 1 1 1 1 1 1	0010500
0010900•	C	0010600
0011000•	C-----GRID	0010700
0011100•	ISTEP=2	0010800
0011200•	JSTEP=8	0010900
0011300•	INDCOS=2	0011000
0011400•	NJ=21	0011100
0011500•	NJM1=NJ-1	0011200
0011600•	ISTP1=ISTEP+1	0011300
0011700•	ISTM1=ISTEP-1	0011400
0011800•	JSTP1=JSTEP+1	0011500
0011900•	JSTM1=JSTEP-1	0011600
0012000•	RLARGE=.0625	0011700
0012100•	ALTOT=.375	0011800
0012200•	IF(IFINE) GO TO 120	0011900
0012300•	C-----COARSE MESH GRID LINES IN X-DIRECTION	0012000
0012400•	NI=20	0012100
0012500•	NIM1=NI-1	0012200
0012600•	EPSX=1.11	0012300
0012700•	IF(EPSX-1.) 13,12,13	0012400
0012800•	13 SUMX=0.5*EPSX**(NI-4)+(EPSX**(NI-3)-1.)/(EPSX-1.)+0.5	0012500
0012900•	GO TO 15	0012600
0013000•	12 CONTINUE	0012700
0013100•	SUMX=NIM1-1	0012800
0013200•	15 DX=ALTOT/SUMX	0012900
0013300•	X(1)=-.5*DX	0013000
0013400•	X(2)=-X(1)	0013100
0013500•	DO 100 I=3,NIM1	0013200
0013600•	X(I)=X(I-1)+DX	0013300
0013700•	100 DX=EPSX*DX	0013400
0013800•	X(NI)=X(NIM1)+(X(NIM1)-X(NI-2))	0013500
0013900•	X(21)=X(20)+(X(20)-X(19))	0013600
0014000•	X(22)=X(21)+(X(20)-X(19))	0013700
0014100•	X(23)=X(22)+(X(20)-X(19))	0013800
0014200•	NI=23	0013900
0014300•	NIM1=NI-1	0014000
0014400•	ALTOT=(X(22)+X(23))/2.	0014100
0014500•	AL1=0.5*(X(ISTEP)+X(ISTM1))	0014200
0014600•	AL2=ALTOT-AL1	0014300
0014700•	C-----FINE MESH GRID LINES IN X-DIRECTION	0014400
0014800•	IF(.NOT. IFINE) GO TO 130	0014500
0014900•	120 NI=30	0014600
0015000•	NIM1=NI-1	0014700
0015100•	EPSX=1.102	0014800
0015200•	IF(EPSX-1.) 17,16,17	0014900
0015300•	17 SUMX=0.5*EPSX**(NI-4)+(EPSX**(NI-3)-1.)/(EPSX-1.)+0.5	0015000
0015400•	GO TO 18	0015100

0047900*	WRITE(11) ED	0047600
0048000*	WRITE(11) VIS	0047700
0048100*	WRITE(11) STF	0047800
0048200*	WRITE(14) YSTLND	0047900
0048300*	702 CONTINUE	0048000
0048400*	C-----CALCULATION OF SHEAR-STRESS COEFFICIENT ALONG LARGE DUCT WALL	0048100
0048500*	WRITE(6,402)	0048200
0048600*	DO 401 I=2,NIM1	0048300
0048700*	SSC=ABS(TAUN(I))/(.5*DENSIT*UIN*UIN)	0048400
0048800*	WRITE(6,403) I,XND(I),SSC	0048500
0048900*	401 CONTINUE	0048600
0049000*	WRITE(6,312)	0048700
0049100*	C-----PLOT DIMENSIONLESS STREAMLINES	0048800
0049200*	LARGE=0	0048900
0049300*	IF(INPLOT .AND. INCALS) CALL PLOT (XUDPLT,IT,NPTS,XAXIS,YSLPLT,	0049000
0049400*	#MAXLN,NPLTLN,YAXES,SYMB L,LARGE)	0049100
0049500*	LARGE=1	0049200
0049600*	IF(INPLOT .AND. INCALS) CALL PLOT (XUDPLT,IT,NPTS,XAXIS,YSLPLT,	0049300
0049700*	#MAXLN,NPLTLN,YAXES,SYMB L,LARGE)	0049400
0049800*	C-----RESET INITIAL CONDITIONS FOR ANOTHER SWIRL CASE	0049500
0049900*	IF(LFS .GE. LFSMAX) GO TO 409	0049600
0050000*	LFS=LFS+1	0049700
0050100*	NITER=0	0049800
0050200*	JPRINT=NITER+300	0049900
0050300*	IPRINT=NITER+1	0050000
0050400*	304 IF(LFS .GE. 3) MAXIT=NITER+200	0050100
0050500*	IF(NSBR .EQ. 0) GO TO 405	0050200
0050600*	WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*UIN	0050300
0050700*	DO 406 J=2,JSTEP	0050400
0050800*	406 W(1,J)=WINST*R(J)/R(JSTEP)	0050500
0050900*	GO TO 408	0050600
0051000*	405 WIN=UIN*TAN(VANB(LFS)*3.14159/180.)	0050700
0051100*	DO 407 J=2,JSTEP	0050800
0051200*	407 W(1,J)=WIN	0050900
0051300*	408 FLOWIN=0.	0051000
0051400*	ARDEN=0.	0051100
0051500*	ARDENT=0.	0051200
0051600*	XMONIN=0.	0051300
0051700*	ANGMOM=0.	0051400
0051800*	WMONIN=0.	0051500
0051900*	C-----READ INITIAL GUESS OF NEXT SWIRL PROBLEM FROM	0051600
0052000*	C-----PREVIOUS SOLN. OF SIMILAR PROBLEM	0051700
0052100*	IF(.NOT. IREAD) GO TO 445	0051800
0052200*	READ(12) U	0051900
0052300*	READ(12) V	0052000
0052400*	READ(12) W	0052100
0052500*	READ(12) P	0052200
0052600*	READ(12) TE	0052300
0052700*	READ(12) ED	0052400
0052800*	READ(12) VIS	0052500
0052900*	READ(12) STF	0052600
0053000*	445 CONTINUE	0052700
0053100*	DO 490 J=2,JSTEP	0052800
0053200*	ARDEN=0.5*(DEN(1,J)+DEN(2,J))*RCV(J)*SNS(J)	0052900

0085700•	1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)	0085400
0085800•	1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF	0085500
0085900•	*VAR/U(48,24),V(48,24),W(48,24),P(48,24),PP(48,24),TE(48,24),	0085600
0086000•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0085700
0086100•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0085800
0086200•	#,VISTAR(48,24)	0085900
0086300•	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0086000
0086400•	1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0086100
0086500•	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0086200
0086600•	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0086300
0086700•	#YND(24),YVND(24)	0086400
0086800•	COMMON	0086500
0086900•	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0086600
0087000•	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0086700
0087100•	1 SP(48,24)	0086800
0087200•	1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,	0086900
0087300•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0087000
0087400•	C	0087100
0087500•	CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1	0087200
0087600•	C	0087300
0087700•	DO 100 I=2,NIM1	0087400
0087800•	DO 101 J=3,NJM1	0087500
0087900•	C-----COMPUTE AREAS AND VOLUME	0087600
0088000•	AREAN=R(J)*SEW(I)	0087700
0088100•	AREAS=R(J-1)*SEW(I)	0087800
0088200•	AREAEW=RV(J)*SNSV(J)	0087900
0088300•	VOL=RV(J)*SEW(I)*SNSV(J)	0088000
0088400•	C-----CALCULATE CONVECTION COEFFICIENTS	0088100
0088500•	GN=DEN(I,J)*(V(I,J+1)*(1.0-WFN(J))+V(I,J)*WFN(J))	0088200
0088600•	GS=DEN(I,J-1)*(V(I,J-1)*(1.0-WFS(J))+V(I,J)*WFS(J))	0088300
0088700•	GE=0.5*(DEN(I+1,J)+DEN(I,J))*U(I+1,J)	0088400
0088800•	GSE=0.5*(DEN(I,J-1)+DEN(I+1,J-1))*U(I+1,J-1)	0088500
0088900•	GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)	0088600
0089000•	GSW=0.5*(DEN(I,J-1)+DEN(I-1,J-1))*U(I,J-1)	0088700
0089100•	CN=GN*AREAN	0088800
0089200•	CS=GS*AREAS	0088900
0089300•	CE=0.5*(GE+GSE)*AREAEW	0089000
0089400•	CW=0.5*(GW+GSW)*AREAEW	0089100
0089500•	C-----CALCULATE DIFFUSION COEFFICIENTS	0089200
0089600•	WISE=0.25*(VIS(I,J)+VIS(I+1,J)+VIS(I,J-1)+VIS(I+1,J-1))	0089300
0089700•	VISW=0.25*(VIS(I,J)+VIS(I-1,J)+VIS(I,J-1)+VIS(I-1,J-1))	0089400
0089800•	DN=VIS(I,J)*AREAN/DYNPV(J)	0089500
0089900•	DS=VIS(I,J-1)*AREAS/DYPSV(J)	0089600
0090000•	DE=WISE*AREAEW/DXEP(I)	0089700
0090100•	DW=VISW*AREAEW/DXPW(I)	0089800
0090200•	C-----CALCULATE COEFFICIENTS OF SOURCE TERMS	0089900
0090300•	SMP=CN-CS+CE-CW	0090000
0090400•	CP=AMAX1(0.0,SMP)	0090100
0090500•	CPO=CP	0090200
0090600•	C-----ASSEMBLE MAIN COEFFICIENTS	0090300
0090700•	DN=AMAX1(DN,-WFN(J)*CN,(1.0-WFN(J))*CN)	0090400
0090800•	DS=AMAX1(DS,WFS(J)*CS,-(1.0-WFS(J))*CS)	0090500
0090900•	AN(I,J)=DN-(1.0-WFN(J))*CN	0090600
0091000•	AS(I,J)=DS+(1.0-WFS(J))*CS	0090700

0123500•	GAMW=0.5*(VIS(I,J)+VIS(I-1,J))/PRTE	0123200
0123600•	DN=GAMN*AREAN/DYNP(J)	0123300
0123700•	DS=GAMS*AREAS/DYPS(J)	0123400
0123800•	DE=GAME*AREAWE/DXEP(I)	0123500
0123900•	DW=GAMW*AREAWE/DXPW(I)	0123600
0124000•	C-----SOURCE TERMS	0123700
0124100•	SMP=CN-CS+CE-CW	0123800
0124200•	CP=AMAX1(0.0,SMP)	0123900
0124300•	CPO=CP	0124000
0124400•	DUDX=(U(I+1,J)-U(I,J))/SEW(I)	0124100
0124500•	DVDY=(V(I,J+1)-V(I,J))/SNS(J)	0124200
0124600•	DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+	0124300
0124700•	1U(I,J-1)+U(I+1,J-1))/4.)/SNS(J)	0124400
0124800•	DVDX=((V(I,J)+V(I,J+1)+V(I+1,J)+V(I+1,J+1))/4.-(V(I,J)+V(I,J+1)+V(I	0124500
0124900•	1I-1,J)+V(I-1,J+1))/4.)/SEW(I)	0124600
0125000•	DWDY=(W(I,J+1)-W(I,J-1))/(DYNP(J)+DYPS(J))-W(I,J)/R(J)	0124700
0125100•	DWDX=(W(I+1,J)-W(I-1,J))/(DXPW(I)+DXEP(I))	0124800
0125200•	GEN(I,J)=(2.*(DUDX**2+DVDY**2)+(DUDY+DVDX)**2)*VIS(I,J)	0124900
0125300•	IF(INDCOS.EQ.2) GEN(I,J)=GEN(I,J)+VIS(I,J)*(DWDY**2+DWDX**2)	0125000
0125400•	IF(RV(J).EQ.0.) GO TO 110	0125100
0125500•	VDR=V(I,J)/RV(J)	0125200
0125600•	IF(INDCOS.EQ.2) GEN(I,J)=GEN(I,J)+VIS(I,J)*.5*	0125300
0125700•	#(VDR+V(I,J+1)/RV(J+1))**2	0125400
0125800•	GO TO 120	0125500
0125900•	110 IF(INDCOS.EQ.2) GEN(I,J)=GEN(I,J)+VIS(I,J)*	0125600
0126000•	#0.5*(V(I,J+1)/RV(J+1))**2	0125700
0126100•	120 CONTINUE	0125800
0126200•	C-----ASSEMBLE MAIN COEFFICIENTS	0125900
0126300•	AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN	0126000
0126400•	AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS	0126100
0126500•	AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE	0126200
0126600•	AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW	0126300
0126700•	SU(I,J)=CPO*TE(I,J)	0126400
0126800•	SUKD(I,J)=SU(I,J)	0126500
0126900•	SU(I,J)=SU(I,J)+GEN(I,J)*VOL	0126600
0127000•	SP(I,J)=-CP	0126700
0127100•	SPKD(I,J)=SP(I,J)	0126800
0127200•	SP(I,J)=SP(I,J)-CD*CMU*DEN(I,J)**2*TE(I,J)*VOL/VIS(I,J)	0126900
0127300•	101 CONTINUE	0127000
0127400•	100 CONTINUE	0127100
0127500•	C	0127200
0127600•	CHAPTER 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2	0127300
0127700•	C	0127400
0127800•	CALL PROMOD (6)	0127500
0127900•	C	0127600
0128000•	CHAPTER 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3	0127700
0128100•	C	0127800
0128200•	RESORK=0.0	0127900
0128300•	DO 300 I=2,NIM1	0128000
0128400•	DO 301 J=2,NJM1	0128100
0128500•	AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0128200
0128600•	RESOR=AN(I,J)*TE(I,J+1)+AS(I,J)*TE(I,J-1)+AE(I,J)*TE(I+1,J)	0128300
0128700•	1 +AW(I,J)*TE(I-1,J)-AP(I,J)*TE(I,J)+SU(I,J)	0128400
0128800•	VOL=RCV(J)*SNS(J)*SEW(I)	0128500

0161300•	J=JMAX(I)	0161000
0161400•	313 AN(I,J)=0.	0161100
0161500•	RETURN	0161200
0161600•	C	0161300
0161700•	CHAPTER 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	0161400
0161800•	C	0161500
0161900•	4 CONTINUE	0161600
0162000•	C-----SIDE WALL	0161700
0162100•	IF(JSTEP.EQ.NJM1) GO TO 414	0161800
0162200•	DO 412 I=2,NIM1	0161900
0162300•	IF(JMAX(I-1).GE.JMAX(I)) GO TO 412	0162000
0162400•	JJ=JMAXP1(I-1)	0162100
0162500•	JI=JMAX(I)	0162200
0162600•	DO 410 J=JJ,JI	0162300
0162700•	AW(I,J)=0.	0162400
0162800•	410 CONTINUE	0162500
0162900•	412 CONTINUE	0162600
0163000•	C-----TOP WALL	0162700
0163100•	414 CONTINUE	0162800
0163200•	DO 402 I=2,NIM1	0162900
0163300•	J=JMAX(I)	0163000
0163400•	402 AN(I,J)=0.0	0163100
0163500•	C-----SYMMETRY AXIS	0163200
0163600•	DO 420 I=2,NIM1	0163300
0163700•	AS(I,2)=0.0	0163400
0163800•	420 CONTINUE	0163500
0163900•	C-----OUTLET	0163600
0164000•	DO 440 J=2,NJM1	0163700
0164100•	AE(NIM1,J)=0.0	0163800
0164200•	440 CONTINUE	0163900
0164300•	RETURN	0164000
0164400•	C	0164100
0164500•	CHAPTER 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0164200
0164600•	C	0164300
0164700•	5 CONTINUE	0164400
0164800•	C-----NO MODIFICATIONS FOR THIS PROBLEM	0164500
0164900•	RETURN	0164600
0165000•	C	0164700
0165100•	CHAPTER 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	0164800
0165200•	C	0164900
0165300•	C	0165000
0165400•	6 CONTINUE	0165100
0165500•	C-----TOP WALL	0165200
0165600•	CDTERM=CMU**0.25	0165300
0165700•	DO 610 I=2,NIM1	0165400
0165800•	J=JMAX(I)	0165500
0165900•	DWDY=(W(I,J+1)-W(I,J-1))/(DYNP(J)+DYPS(J))	0165600
0166000•	UAVG=U(I,J)*WFE(I)+(1.-WFE(I))*U(I+1,J)	0165700
0166100•	UEFF=SQRT(UAVG*UAVG + W(I,J)*W(I,J))	0165800
0166200•	YP=YV(J+1)-Y(J)	0165900
0166300•	DENU=DEN(I,J)	0166000
0166400•	SQRTK=SQRT(TE(I,J))	0166100
0166500•	VOL=RCV(J)*SNS(J)*SEW(I)	0166200
0166600•	YPLUSN(I)=DENU*SQRTK*CDTERM*YP/VISCOS	0166300

0199100•	RETURN	0198800
0199200•	100 FORMAT(11H Y-AXES ARE,5X,10(1X,A10))	0198900
0199300•	101 FORMAT(11H0,2X,11F10.1)	0199000
0199400•	102 FORMAT(15H MAXIMUM VALUES, 10E11.3)	0199100
0199500•	103 FORMAT(11H1X-AXIS IS ,A3)	0199200
0199600•	104 FORMAT(3X,11F10.1)	0199300
0199700•	105 FORMAT(2H X,F6.2,3X,101A1,F6.2)	0199400
0199800•	106 FORMAT(7H SYMBOL,11X,10(1X,A10))	0199500
0199900•	107 FORMAT(2H X,F6.2,3X,101A1,F6.2)	0199600
0200000•	115 FORMAT(///,T50,'RADIAL POSITION R/D',/)	0199700
0200100•	120 FORMAT(///,T50,'RADIAL POSITION 2R/D',/)	0199800
0200200•	130 FORMAT(///,T45,'DIMENSIONLESS STREAMLINE PLOT')	0199900
0200300•	RETURN	0200000
0200400•	END	0200100
0200500•	U VELOCITY	0200600
0200600•	V VELOCITY	0200700
0200700•	W VELOCITY	0200800
0200800•	PRESSURE	0200900
0200900•	TEMPERATURE	0201000
0201000•	TURBULENCE ENERGY	0201100
0201100•	TURBULENCE DISSIPATION	0201200
0201200•	VISCOSITY	0201300
0201300•	DIMENSIONLESS LENGTH SCALE	0201400
0201400•	DIMENSIONLESS STREAM FUNCTION	0201500
0201500•	RADIAL COORDINATE OF STREAMLINES	0201600
0201600•	DIMENSIONLESS U VELOCITY	0201700
0201700•	DIMENSIONLESS V VELOCITY	0201800
0201800•	DIMENSIONLESS W VELOCITY	0201900
0201900•	DIMENSIONLESS PRESSURE	0202000
0202000•	DIMENSIONLESS TURBULENCE ENERGY	0202100
0202100•	DIMENSIONLESS STREAMLINE COORDS	0202200
0202200•	DIMENSIONLESS EFF. VISCOSITY	0202300

0015500•	16	CONTINUE	0015200
0015600•		SUMX=NIM1-1	0015300
0015700•	18	DX=ALTOT/SUMX	0015400
0015800•		X(1)=-.5*DX	0015500
0015900•		X(2)=-X(1)	0015600
0016000•		DO 170 I=3,NIM1	0015700
0016100•		X(I)=X(I-1)+DX	0015800
0016200•	170	DX=EPSX*DX	0015900
0016300•		X(NI)=X(NIM1)+(X(NIM1)-X(NI-2))	0016000
0016400•		DO 180 L=31,35	0016100
0016500•	180	X(L)=X(L-1)+(X(NI)-X(NIM1))	0016200
0016600•		NI=35	0016300
0016700•		NIM1=NI-1	0016400
0016800•		ALTOT=(X(NIM1)+X(NI))/2.	0016500
0016900•		AL1=0.5*(X(ISTEP)+X(ISTM1))	0016600
0017000•		AL2=ALTOT-AL1	0016700
0017100•	C-----	SPECIFY RADIAL HEIGHT(NO. OF J-CELLS) OF COMBUSTOR	0016800
0017200•	C-----	WALL FOR EACH I GRID LINE	0016900
0017300•	130	CONTINUE	0017000
0017400•		JMAX(1)=JSTEP	0017100
0017500•		JMAXP(1)=JMAX(1)+1	0017200
0017600•		DO 160 I=2,NI	0017300
0017700•		JMAX(I)=JMAX(I-1)+3	0017400
0017800•		IF(JMAX(I-1).EQ. NJM1) JMAX(I)=JMAX(I-1)	0017500
0017900•	160	JMAXP(I)=JMAX(I)+1	0017600
0018000•	C-----	GRID LINES IN Y-DIRECTION	0017700
0018100•		Y(1)=-1.5625E-3	0017800
0018200•		Y(2)=1.5625E-3	0017900
0018300•		Y(3)=5.625E-3	0018000
0018400•		Y(4)=1.0625E-2	0018100
0018500•		Y(5)=1.625E-2	0018200
0018600•		Y(6)=2.1875E-2	0018300
0018700•		Y(7)=2.6875E-2	0018400
0018800•		Y(8)=3.03125E-2	0018500
0018900•		Y(9)=3.21875E-2	0018600
0019000•		Y(10)=3.4375E-2	0018700
0019100•		Y(11)=3.71875E-2	0018800
0019200•		Y(12)=4.09375E-2	0018900
0019300•		Y(13)=4.328125E-2	0019000
0019400•		Y(14)=4.5625E-2	0019100
0019500•		Y(15)=4.8125E-2	0019200
0019600•		Y(16)=5.078125E-2	0019300
0019700•		Y(17)=5.34375E-2	0019400
0019800•		Y(18)=5.59375E-2	0019500
0019900•		Y(19)=5.9375E-2	0019600
0020000•		Y(20)=6.1875E-2	0019700
0020100•		Y(21)=6.3125E-2	0019800
0020200•		RSMALL=0.5*(Y(JSTEP)+Y(JSTP1))	0019900
0020300•	C-----	DEPENDENT VARIABLE SELECTION	0020000
0020400•		INCALU=.TRUE.	0020100
0020500•		INCALV=.TRUE.	0020200
0020600•		INCALW=.TRUE.	0020300
0020700•		INCALP=.TRUE.	0020400
0020800•		INCALK=.TRUE.	0020500

0053300•	XMONIN=XMONIN+ARDEN*U(2,J)*U(2,J)	0053000
0053400•	WMONIN=WMONIN+ARDEN*U(2,J)*W(1,J)	0053100
0053500•	ANGMOM=ANGMOM+ARDEN*U(2,J)*W(1,J)*R(J)	0053200
0053600•	ARDENT=ARDENT+ARDEN	0053300
0053700•	490 FLOWIN=FLOWIN+ARDEN*U(2,J)	0053400
0053800•	UMEAN=FLOWIN/ARDENT	0053500
0053900•	SWRLNO=ANGMOM/(XMONIN*RSMALL)	0053600
0054000•	IF(W(1,JSTEP).EQ.0.) WMONIN=1.	0053700
0054100•	WRITE(6,310) IMON,JMON	0053800
0054200•	GO TO 300	0053900
0054300•	409 CONTINUE	0054000
0054400•	STOP	0054100
0054500•	C-----FORMAT STATEMENTS	0054200
0054600•	211 FORMAT(1H1,T37,'AXISYMMETRIC,ISOTHERMAL,GT COMBUSTOR FLOWFIELD SI	0054300
0054700•	#MULATION',//,T35,'USING THE STAIRSTEP APPROXIMATION FOR THE SLOPIN	0054400
0054800•	#G EXPANSION WALL',//,T53,'AND THE K-E TURBULENCE MODEL')	0054500
0054900•	225 FORMAT(////,T40,'EXPANSION ANGLE(DEG.) =',T77,1PE13.3)	0054600
0055000•	230 FORMAT(///,T40,'NUMBER OF STAIRSTEPS =',T81,I1)	0054700
0055100•	235 FORMAT(///,T40,'INLET RADIUS(M) =',T77,1PE13.3)	0054800
0055200•	240 FORMAT(///,T40,'COMBUSTOR RADIUS(M) =',T77,1PE13.3)	0054900
0055300•	245 FORMAT(///,T40,'COMBUSTOR LENGTH(M) =',T77,1PE13.3)	0055000
0055400•	250 FORMAT(///,T40,'INLET REYNOLDS NO.(USING DIAM.) =',T77,1PE13.3)	0055100
0055500•	255 FORMAT(///,T40,'LAMINAR VISCOSITY(KG/M/SEC) =',T77,1PE13.3)	0055200
0055600•	260 FORMAT(///,T40,'DENSITY(KG/CU. M) =',T77,1PE13.3,////)	0055300
0055700•	310 FORMAT(13H0ITER I---, 9X,29HABSOLUTE RESIDUAL SOURCE SUMS,9X,	0055400
0055800•	111H---I I---,37H FIELD VALUES AT MONITORING LOCATIONI,I2,1H,,I2,	0055500
0055900•	*6H) ---I/14H NO UMON,7X,'VMON',7X,'WMON',7X,'MASS',7X,	0055600
0056000•	*'TKIN'	0055700
0056100•	3,7X,4HDISP,9X,1HU,9X,1HV,10X,1HW,10X,1HP,10X,1HD//)	0055800
0056200•	311 FORMAT(2X,I4,11E11.4)	0055900
0056300•	312 FORMAT(1H0,59(2H-))	0056000
0056400•	402 FORMAT(///9X,1HI,5X,3HX/D,5X,10HS.S.COEFF.)	0056100
0056500•	403 FORMAT(/5X,I5,2(1PE11.3))	0056200
0056600•	410 FORMAT(//23H SWIRL CASE WITH LFS =,I3/	0056300
0056700•	1 23H AND NSBR =,I3//	0056400
0056800•	163H CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER =	0056500
0056900•	1,F10.3//37H OR IF NSBR = 0 TO SWIRL VANE ANGLE =,F10.3//,	0056600
0057000•	11X,'COMPUTED INLET SWIRL NUMBER =',F10.4//,	0056700
0057100•	11X,'COMPUTED INLET MEAN AXIAL VELOCITY =',F10.4//,	0056800
0057200•	11X,'COMPUTED INLET MASS FLOW RATE =',F10.5/////)	0056900
0057300•	950 FORMAT(10X,6F10.5,/,10X,6F10.5,/,10X,4F10.5)	0057000
0057400•	960 FORMAT(15X,'THE SOLN. IS NOT CONVERGING')	0057100
0057500•	END	0057200
0057600•	C	0057300
0057700•	C-----	0057400
0057800•	C	0057500
0057900•	SUBROUTINE INIT	0057600
0058000•	CA*****	0057700
0058100•	C	0057800
0058200•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0057900
0058300•	C	0058000
0058400•	COMMON	0058100
0058500•	1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)	0058200
0058600•	1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)	0058300

0091100•	AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE	0090800
0091200•	AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW	0090900
0091300•	DV(I,J)=0.5*(AREAN+AREAS)	0091000
0091400•	DUDYE=(U(I+1,J)-U(I+1,J-1))/SNSV(J)	0091100
0091500•	DUDYW=(U(I,J)-U(I,J-1))/SNSV(J)	0091200
0091600•	SORCE1=(DUDYE*VISE-DUDYW*VISW)/DXEPU(I)	0091300
0091700•	DVDYN=(V(I,J+1)-V(I,J))/DYNPV(J)	0091400
0091800•	DVDYS=(V(I,J)-V(I,J-1))/DYPVS(J)	0091500
0091900•	SORCE2=(VIS(I,J)*RCV(J)*DVDYN-VIS(I,J-1)*RCV(J-1)*DVDYS)	0091600
0092000•	# / (RV(J)*SNSV(J))	0091700
0092100•	SU(I,J)=CP0*V(I,J)+DV(I,J)*(P(I,J-1)-P(I,J))	0091800
0092200•	SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL	0091900
0092300•	SP(I,J)=-CP	0092000
0092400•	IF(INDCOS.EQ. 1) GO TO 101	0092100
0092500•	SU(I,J)=SU(I,J)+VOL*((DEN(I,J)+DEN(I,J-1))*(W(I,J)+W(I,J-1)	0092200
0092600•	#)**2)/(8.*RV(J))	0092300
0092700•	SP(I,J)=SP(I,J)-(VIS(I,J)+VIS(I,J-1))*VOL/RV(J)**2	0092400
0092800•	101 CONTINUE	0092500
0092900•	100 CONTINUE	0092600
0093000•	C	0092700
0093100•	CHAPTER 2 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 2	0092800
0093200•	C	0092900
0093300•	CALL PROMOD (3)	0093000
0093400•	C	0093100
0093500•	CHAPTER 3 FINAL COEFF. ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3 3	0093200
0093600•	C	0093300
0093700•	RESORV=0.0	0093400
0093800•	DO 300 I=2,NIM1	0093500
0093900•	DO 301 J=3,NJM1	0093600
0094000•	AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0093700
0094100•	DV(I,J)=DV(I,J)/AP(I,J)	0093800
0094200•	RESOR=AN(I,J)*V(I,J+1)+AS(I,J)*V(I,J-1)+AE(I,J)*V(I+1,J)	0093900
0094300•	1 +AW(I,J)*V(I-1,J)-AP(I,J)*V(I,J)+SU(I,J)	0094000
0094400•	VOL=RV(J)*SEW(I)*SNSV(J)	0094100
0094500•	SORVOL=GREAT*VOL	0094200
0094600•	IF(-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL	0094300
0094700•	RESORV=RESORV+ABS(RESOR)	0094400
0094800•	C-----UNDER-RELAXATION	0094500
0094900•	AP(I,J)=AP(I,J)/URFV	0094600
0095000•	SU(I,J)=SU(I,J)+(1.-URFV)*AP(I,J)*V(I,J)	0094700
0095100•	DV(I,J)=DV(I,J)*URFV	0094800
0095200•	301 CONTINUE	0094900
0095300•	300 CONTINUE	0095000
0095400•	C	0095100
0095500•	CHAPTER 4 4 4 SOLUTION OF DIFFERENCE EQUATION 4 4 4 4 4 4 4	0095200
0095600•	C	0095300
0095700•	DO 400 N=1,NSWPV	0095400
0095800•	400 CALL LISOLV(2,3,NI,JMAX,IT,JT,V,3)	0095500
0095900•	RETURN	0095600
0096000•	END	0095700
0096100•	C	0095800
0096200•	C-----	0095900
0096300•	C	0096000
0096400•	SUBROUTINE CALCW	0096100

0128900•	SORVOL=GREAT*VOL	0128600
0129000•	IF(-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL	0128700
0129100•	RESORK=RESORK+ABS(RESOR)	0128800
0129200•	C-----UNDER-RELAXATION	0128900
0129300•	AP(I,J)=AP(I,J)/URFK	0129000
0129400•	SU(I,J)=SU(I,J)+(1.-URFK)*AP(I,J)*TE(I,J)	0129100
0129500•	301 CONTINUE	0129200
0129600•	300 CONTINUE	0129300
0129700•	C	0129400
0129800•	CHAPTER 4 4 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4	0129500
0129900•	C	0129600
0130000•	DO 400 N=1,NSWPK	0129700
0130100•	400 CALL LISOLV(2,2,NI,JMAX,IT,JT,TE,6)	0129800
0130200•	RETURN	0129900
0130300•	END	0130000
0130400•	C	0130100
0130500•	C-----	0130200
0130600•	C	0130300
0130700•	SUBROUTINE CALCED	0130400
0130800•	CA*****	0130500
0130900•	C	0130600
0131000•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0130700
0131100•	C	0130800
0131200•	COMMON	0130900
0131300•	1/TDIS/RESORE,NSWPK,URFE	0131000
0131400•	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0131100
0131500•	1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0131200
0131600•	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0131300
0131700•	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0131400
0131800•	#YND(24),YVND(24)	0131500
0131900•	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0131600
0132000•	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0131700
0132100•	1 SP(48,24)	0131800
0132200•	*VAR/U(48,24),V(48,24),W(48,24),P(48,24),PP(48,24),TE(48,24),	0131900
0132300•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0132000
0132400•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0132100
0132500•	#,VISTAR(48,24)	0132200
0132600•	COMMON	0132300
0132700•	1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE	0132400
0132800•	1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)	0132500
0132900•	1/SUSP/SUKD(48,24),SPKD(48,24)	0132600
0133000•	1/KASE T1/UITN,TEIN,EDIN,FLOWIN,ALAMDA,	0132700
0133100•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0132800
0133200•	C	0132900
0133300•	CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1	0133000
0133400•	C	0133100
0133500•	DO 100 I=2,NIM1	0133200
0133600•	JJ=JMAX(I)	0133300
0133700•	DO 101 J=2,JJ	0133400
0133800•	C-----COMPUTE AREAS AND VOLUME	0133500
0133900•	AREAN=RV(J+1)*SEW(I)	0133600
0134000•	AREAS=RV(J)*SEW(I)	0133700
0134100•	AREAEW=RCV(J)*SNS(J)	0133800
0134200•	VOL=RCV(J)*SNS(J)*SEW(I)	0133900

0166700•	IF(YPLUSN(I) .LE. 11.63) GO TO 608	0166400
0166800•	TMULT=DENU*CDTERM*SQRK*CAPPA/ALOG(ELOG*YPLUSN(I))	0166500
0166900•	TAUN(I)=-TMULT*UEFF	0166600
0167000•	DITERM=DEN(I,J)*(CMU*.75)*SQRK*ALOG(ELOG*YPLUSN(I))/(CAPPA*YP)	0166700
0167100•	GO TO 609	0166800
0167200•	608 TAURX=-VISCOS*UAVG/YP	0166900
0167300•	TAURW=VISCOS*(-W(I,J)/YP - W(I,J)/Y(J))	0167000
0167400•	TAUN(I)=SQRT(TAURX**2+TAURW**2)	0167100
0167500•	DITERM=DEN(I,J)*(CMU*.75)*SQRK*YPLUSN(I)/YP	0167200
0167600•	609 DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+U(I	0167300
0167700•	4I,J-1)+U(I+1,J-1))/4.)/SNS(J)	0167400
0167800•	GENCOU=TAUN(I)**2/VIS(I,J)	0167500
0167900•	GENRES=GEN(I,J)-VIS(I,J)*(DUDY**2+(DWDY-W(I,J)/Y(J))**2)	0167600
0168000•	GEN(I,J)=GENRES+GENCOU	0167700
0168100•	SU(I,J)=GEN(I,J)*VOL+SUKD(I,J)	0167800
0168200•	SP(I,J)=-DITERM*VOL+SPKD(I,J)	0167900
0168300•	AN(I,J)=0.0	0168000
0168400•	610 CONTINUE	0168100
0168500•	TAUN(NI)=TAUN(NIM1)	0168200
0168600•	C-----SIDE WALL	0168300
0168700•	IF(JSTEP .EQ. NJM1) GO TO 614	0168400
0168800•	DO 625 I=2,NIM1	0168500
0168900•	IF(JMAX(I-1) .GE. JMAX(I)) GO TO 625	0168600
0169000•	JJ=JMAXP1(I-1)	0168700
0169100•	JI=JMAX(I)	0168800
0169200•	DO 620 J=JJ,JI	0168900
0169300•	DWDX=(W(I+1,J)-W(I-1,J))/(DXPW(I)+DXEP(I))	0169000
0169400•	VAVG=V(I,J)*WFN(J)+(1.-WFN(J))*V(I,J+1)	0169100
0169500•	VEFF=SQRT(VAVG*VAVG + W(I,J)*W(I,J))	0169200
0169600•	XP=X(I)-XU(I)	0169300
0169700•	DENV=DEN(I,J)	0169400
0169800•	SQRK=SQRT(TE(I,J))	0169500
0169900•	VOL=RCV(J)*SNS(J)*SEW(I)	0169600
0170000•	XPLUSW(J)=DENV*SQRK*CDTERM*XP/VISCOS	0169700
0170100•	IF(XPLUSW(J) .LE. 11.63) GO TO 621	0169800
0170200•	TMULT=DENV*CDTERM*SQRK*CAPPA/ALOG(ELOG*XPLUSW(J))	0169900
0170300•	TAUW(J)=-TMULT*VEFF	0170000
0170400•	DITERM=DEN(I,J)*(CMU*.75)*SQRK*ALOG(ELOG*XPLUSW(J))/(CAPPA*XP)	0170100
0170500•	GO TO 622	0170200
0170600•	621 TAUXR=VISCOS*VAVG/XP	0170300
0170700•	TAUXW=VISCOS*W(I,J)/XP	0170400
0170800•	TAUW(J)=SQRT(TAUXR**2+TAUXW**2)	0170500
0170900•	DITERM=DEN(I,J)*(CMU*.75)*SQRK*XPLUSW(J)/XP	0170600
0171000•	622 DVDX=((V(I,J)+V(I,J+1)+V(I+1,J)+V(I+1,J+1))/4.-(V(I,J)+V(I,J+1)+V(I	0170700
0171100•	3I-1,J)+V(I-1,J+1))/4.)/SEW(I)	0170800
0171200•	GENCOU=TAUW(J)**2/VIS(I,J)	0170900
0171300•	GENRES=GEN(I,J)-VIS(I,J)*(DVDX**2+DWDX**2)	0171000
0171400•	GEN(I,J)=GENRES+GENCOU	0171100
0171500•	SU(I,J)=SU(I,J)+SUKD(I,J)+GEN(I,J)*VOL	0171200
0171600•	SP(I,J)=SP(I,J)+SPKD(I,J)-DITERM*VOL	0171300
0171700•	AW(I,J)=0.0	0171400
0171800•	620 CONTINUE	0171500
0171900•	625 CONTINUE	0171600
0172000•	TAUW(NJ)=TAUW(NJM1)	0171700

0020900•	INCALD=.TRUE.	0020600
0021000•	INPRO=.TRUE.	0020700
0021100•	INCALS=.TRUE.	0020800
0021200•	C-----FLUID PROPERTIES	0020900
0021300•	C-----TURBULENCE CONSTANTS	0021000
0021400•	CMU=0.09	0021100
0021500•	CD=1.00	0021200
0021600•	C1=1.44	0021300
0021700•	C2=1.92	0021400
0021800•	CAPPA=.4187	0021500
0021900•	ELOG=9.793	0021600
0022000•	PRED=CAPPA*CAPPA/(C2-C1)/(CMU**.5)	0021700
0022100•	PRTE=1.0	0021800
0022200•	C-----BOUNDARY VALUES	0021900
0022300•	UIN=30.	0022000
0022400•	ULARGE=UIN*(RSMALL/RLARGE)**2	0022100
0022500•	TURBIN=.03	0022200
0022600•	TEIN=TURBIN*UIN**2	0022300
0022700•	ALAMDA=0.005	0022400
0022800•	EDIN=TEIN**1.5/(ALAMDA*RLARGE)	0022500
0022900•	VISCOS=1.8E-5	0022600
0023000•	C-----PRESSURE CALCULATION	0022700
0023100•	IPREF=2	0022800
0023200•	JPREF=2	0022900
0023300•	C-----PROGRAM CONTROL AND MONITOR	0023000
0023400•	IMON=NIM1	0023100
0023500•	JMON=8	0023200
0023600•	SORMAX=.004	0023300
0023700•	C	0023400
0023800•	CHAPTER 2 2 2 2 2 2 INITIAL OPERATIONS 2 2 2 2 2 2 2 2	0023500
0023900•	CALL INIT	0023600
0024000•	C-----NONDIMENSIONALIZE X & Y VARIABLES FOR NONDIMENSIONAL OUTPUT	0023700
0024100•	DO 50 I=1,NI	0023800
0024200•	XND(I)=X(I)/(2.*RLARGE)	0023900
0024300•	50 XUND(I)=XU(I)/(2.*RLARGE)	0024000
0024400•	DO 60 J=1,NJ	0024100
0024500•	YND(J)=Y(J)/(2.*RLARGE)	0024200
0024600•	60 YVND(J)=YV(J)/(2.*RLARGE)	0024300
0024700•	C-----INITIALISE VARIABLE FIELDS	0024400
0024800•	FLOWIN=0.0	0024500
0024900•	ARDEN=0.0	0024600
0025000•	ARDENT=0.	0024700
0025100•	XMONIN=0.	0024800
0025200•	WMONIN=0.0	0024900
0025300•	ANGMOM=0.	0025000
0025400•	C	0025100
0025500•	C-----INLET SWIRL VELOCITY PROFILE	0025200
0025600•	C	0025300
0025700•	C-----W, USE SOLID BODY ROTATION MODEL	0025400
0025800•	WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*UIN	0025500
0025900•	DO 206 J=2,JSTEP	0025600
0026000•	206 W(1,J)=WINST*R(J)/R(JSTEP)	0025700
0026100•	C-----NSBR=0 - FLAT SWIRL VELOCITY PROFILE FROM SWIRL VANES	0025800
0026200•	C-----NSBR=1 - SOLID BODY ROTATION FROM SWIRL GENERATOR	0025900

0058700•	* /WVEL/ RESORW, NSWPW, URFW	0058400
0058800•	1 /PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF	0058500
0058900•	* /VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0058600
0059000•	* ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0058700
0059100•	* VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0058800
0059200•	#,VISTAR(48,24)	0058900
0059300•	1 /ALL/IT, JT, NI, NJ, NIM1, NJM1, GREAT, JMAX(48), JMAXP1(48)	0059000
0059400•	1 /GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0059100
0059500•	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0059200
0059600•	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0059300
0059700•	#YND(24),YVND(24)	0059400
0059800•	COMMON	0059500
0059900•	1 /FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0059600
0060000•	1 /KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,	0059700
0060100•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0059800
0060200•	1 /TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE	0059900
0060300•	1 /WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUH(24)	0060000
0060400•	1 /COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0060100
0060500•	1 SP(48,24)	0060200
0060600•	1 /PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT	0060300
0060700•	C	0060400
0060800•	CHAPTER 1 1 1 1 1 CALCULATE GEOMETRICAL QUANTITIES 1 1 1 1 1	0060500
0060900•	C	0060600
0061000•	DO 100 J=1,NJ	0060700
0061100•	R(J)=Y(J)	0060800
0061200•	100 IF(INDCOS.EQ.1)R(J)=1.0	0060900
0061300•	DXPW(1)=0.0	0061000
0061400•	DXEP(1)=0.0	0061100
0061500•	DO 101 I=1,NIM1	0061200
0061600•	DXEP(I)=X(I+1)-X(I)	0061300
0061700•	101 DXPW(I+1)=DXEP(I)	0061400
0061800•	DYPS(1)=0.0	0061500
0061900•	DYNP(NJ)=0.0	0061600
0062000•	DO 102 J=1,NJM1	0061700
0062100•	DYNP(J)=Y(J+1)-Y(J)	0061800
0062200•	102 DYPS(J+1)=DYNP(J)	0061900
0062300•	SEW(1)=0.0	0062000
0062400•	SEW(NI)=0.0	0062100
0062500•	DO 103 I=2,NIM1	0062200
0062600•	103 SEW(I)=0.5*(DXEP(I)+DXPW(I))	0062300
0062700•	SNS(1)=0.0	0062400
0062800•	SNS(NJ)=0.0	0062500
0062900•	DO 104 J=2,NJM1	0062600
0063000•	104 SNS(J)=0.5*(DYNP(J)+DYPS(J))	0062700
0063100•	XU(1)=0.0	0062800
0063200•	DO 105 I=2,NI	0062900
0063300•	105 XU(I)=0.5*(X(I)+X(I-1))	0063000
0063400•	DXPWU(1)=0.0	0063100
0063500•	DXPWU(2)=0.0	0063200
0063600•	DXEPU(1)=0.0	0063300
0063700•	DXEPU(NI)=0.0	0063400
0063800•	DO 106 I=2,NIM1	0063500
0063900•	DXEPU(I)=XU(I+1)-XU(I)	0063600
0064000•	106 DXPWU(I+1)=DXEPU(I)	0063700

0096500•	CA*****	0096200
0096600•	C	0096300
0096700•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0	0096400
0096800•	C	0096500
0096900•	COMMON	0096600
0097000•	1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)	0096700
0097100•	1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)	0096800
0097200•	*/WVEL/ RESORW, NSWPW, URFW	0096900
0097300•	1/TEN/RESORK,NSWPK,URFK	0097000
0097400•	1/TDIS/RESORE,NSWPD,URFE	0097100
0097500•	*/VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0097200
0097600•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0097300
0097700•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0097400
0097800•	*,VISTAR(48,24)	0097500
0097900•	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0097600
0098000•	1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0097700
0098100•	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0097800
0098200•	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0097900
0098300•	#YND(24),YVND(24)	0098000
0098400•	COMMON	0098100
0098500•	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0098200
0098600•	1/KASE T1/IN,TEIN,EDIN,FLOWIN,ALAMDA,	0098300
0098700•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0098400
0098800•	1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE	0098500
0098900•	1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)	0098600
0099000•	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0098700
0099100•	1 SP(48,24)	0098800
0099200•	C-----IF NO SWIRL, RETURN TO MAIN	0098900
0099300•	IF(W(1,3) .LE. 0.) GO TO 500	0099000
0099400•	C	0099100
0099500•	CHAPTER 1 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1	0099200
0099600•	C	0099300
0099700•	DO 100 I=2, NIM1	0099400
0099800•	DO 101 J=2, NJM1	0099500
0099900•	C	0099600
0100000•	C COMPUTE AREAS AND VOLUME	0099700
0100100•	C	0099800
0100200•	AREAN=RV(J+1)*SEW(I)	0099900
0100300•	AREAS=RV(J)*SEW(I)	0100000
0100400•	AREAEW=RCV(J)*SNS(J)	0100100
0100500•	VOL=RCV(J)*SNS(J)*SEW(I)	0100200
0100600•	C	0100300
0100700•	C-----CALCULATE CONVECTION COEFFICIENTS	0100400
0100800•	C	0100500
0100900•	GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)	0100600
0101000•	GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)	0100700
0101100•	GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)	0100800
0101200•	GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)	0100900
0101300•	CN=GN*AREAN	0101000
0101400•	CS=GS*AREAS	0101100
0101500•	CE=GE*AREAEW	0101200
0101600•	CW=GW*AREAEW	0101300
0101700•	C	0101400
0101800•	C-----CALCULATE DIFFUSION COEFFICIENTS	0101500

0134300•	C-----CALCULATE CONVECTION COEFFICIENTS	0134000
0134400•	GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)	0134100
0134500•	GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)	0134200
0134600•	GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)	0134300
0134700•	GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)	0134400
0134800•	CN=GN*AREAN	0134500
0134900•	CS=GS*AREAS	0134600
0135000•	CE=GE*AREAEW	0134700
0135100•	CW=GW*AREAEW	0134800
0135200•	C-----CALCULATE DIFFUSION COEFFICIENTS	0134900
0135300•	GAMN=0.5*(VIS(I,J)+VIS(I,J-1))/PRED	0135000
0135400•	GAMS=0.5*(VIS(I,J)+VIS(I,J-1))/PRED	0135100
0135500•	GAME=0.5*(VIS(I,J)+VIS(I+1,J))/PRED	0135200
0135600•	GAMW=0.5*(VIS(I,J)+VIS(I-1,J))/PRED	0135300
0135700•	DN=GAMN*AREAN/DYNP(J)	0135400
0135800•	DS=GAMS*AREAS/DYPS(J)	0135500
0135900•	DE=GAME*AREAEW/DXEP(I)	0135600
0136000•	DW=GAMW*AREAEW/DXPW(I)	0135700
0136100•	C-----SOURCE TERMS	0135800
0136200•	SMP=CN-CS+CE-CW	0135900
0136300•	CP=AMAX1(0.0,SMP)	0136000
0136400•	CPO=CP	0136100
0136500•	C-----ASSEMBLE MAIN COEFFICIENTS	0136200
0136600•	AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN	0136300
0136700•	AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS	0136400
0136800•	AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE	0136500
0136900•	AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW	0136600
0137000•	SU(I,J)=CPO*ED(I,J)	0136700
0137100•	SUKD(I,J)=SU(I,J)	0136800
0137200•	SU(I,J)=SU(I,J)+C1*CMU*GEN(I,J)*VOL*DEN(I,J)*TE(I,J)/VIS(I,J)	0136900
0137300•	SP(I,J)=-CP	0137000
0137400•	SPKD(I,J)=SP(I,J)	0137100
0137500•	SP(I,J)=SP(I,J)-C2*DEN(I,J)*ED(I,J)*VOL/TE(I,J)	0137200
0137600•	101 CONTINUE	0137300
0137700•	100 CONTINUE	0137400
0137800•	C	0137500
0137900•	CHAPTER 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2	0137600
0138000•	C	0137700
0138100•	CALL PROMOD (7)	0137800
0138200•	C	0137900
0138300•	CHAPTER 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3	0138000
0138400•	C	0138100
0138500•	RESORE=0.0	0138200
0138600•	DO 300 I=2,NIM1	0138300
0138700•	DO 301 J=2,NJM1	0138400
0138800•	AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0138500
0138900•	RESOR=AN(I,J)*ED(I,J+1)+AS(I,J)*ED(I,J-1)+AE(I,J)*ED(I+1,J)	0138600
0139000•	1 +AW(I,J)*ED(I-1,J)-AP(I,J)*ED(I,J)+SU(I,J)	0138700
0139100•	VOL=RCV(J)*SNS(J)*SEW(I)	0138800
0139200•	SORVOL=GR2AT*VOL	0138900
0139300•	IF(-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL	0139000
0139400•	RESORE=RESORE+ABS(RESOR)	0139100
0139500•	C-----UNDER-RELAXATION	0139200
0139600•	AP(I,J)=AP(I,J)/URFE	0139300

C-----SYMMETRY AXIS 614 CONTINUE J=2 DO 630 I=2,NIM1 DUDY=((U(I,J)+U(I+1,J))+U(I,J+1)+U(I+1,J+1))/4.- $(U(I,J)+U(I+1,J)+$ $3U(I,J-1)+U(I+1,J-1))/4.) / SNS(J)$ VOL=RCV(J)*SNS(J)*SEW(I) GEN(I,J)=GEN(I,J)-VIS(I,J)*DUDY**2 SU(I,J)=SUKD(I,J)+GEN(I,J)*VOL 630 AS(I,2)=0.0 C-----OUTLET DO 640 J=2,NJM1 AE(NIM1,J)=0.0 640 CONTINUE RETURN C CHAPTER 7 7 7 7 7 7 7 7 DISSIPATION 7 7 7 7 7 7 7 7 C 7 CONTINUE C-----TOP WALL DO 710 I=2,NIM1 J=JMAX(I) YP=YV(J+1)-Y(J) TERM=(CMU**.75)/(CAPPA*YP) SU(I,J)=GREAT*TERM*TE(I,J)**1.5 710 SP(I,J)=-GREAT C-----SIDE WALL IF(JSTEP.EQ.NJM1) GO TO 714 DO 725 I=2,NIM1 IF(JMAX(I-1).GE.JMAX(I)) GO TO 725 JJ=JMAXP1(I-1) JI=JMAX(I) DO 720 J=JJ,JI IF(J.EQ.JMAX(I)) GO TO 720 XP=X(I)-XU(I) TERM=(CMU**.75)/(CAPPA*XP) SU(I,J)=GREAT*TERM*TE(I,J)**1.5 SP(I,J)=-GREAT 720 CONTINUE 725 CONTINUE C-----SYMMETRY AXIS 714 CONTINUE DO 730 I=2,NIM1 730 AS(I,2)=0.0 C-----OUTLET DO 740 J=2,NJM1 AE(NIM1,J)=0.0 740 CONTINUE RETURN C CHAPTER 8 C SWIRL VELOCITY C 8 CONTINUE	0172100• 0172200• 0172300• 0172400• 0172500• 0172600• 0172700• 0172800• 0172900• 0173000• 0173100• 0173200• 0173300• 0173400• 0173500• 0173600• 0173700• 0173800• 0173900• 0174000• 0174100• 0174200• 0174300• 0174400• 0174500• 0174600• 0174700• 0174800• 0174900• 0175000• 0175100• 0175200• 0175300• 0175400• 0175500• 0175600• 0175700• 0175800• 0175900• 0176000• 0176100• 0176200• 0176300• 0176400• 0176500• 0176600• 0176700• 0176800• 0176900• 0177000• 0177100• 0177200• 0177300• 0177400•
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0026300•	IF (NSBR .EQ. 1) GO TO 208	0026000
0026400•	C-----W, FLAT PROFILE	0026100
0026500•	WIN=UIN*TAN(VANB(LFS)*3.14159/180.)	0026200
0026600•	DO 207 J=2,JSTEP	0026300
0026700•	207 W(1,J)=WIN	0026400
0026800•	208 CONTINUE	0026500
0026900•	C-----INITIALIZE U-,TE-,ED-, & W-FIELDS	0026600
0027000•	DO 200 J=2,JSTEP	0026700
0027100•	U(2,J)=UIN	0026800
0027200•	TE(1,J)=TEIN	0026900
0027300•	ED(1,J)=EDIN	0027000
0027400•	ARDEN=0.5*(DEN(1,J)+DEN(2,J))*RCV(J)*SNS(J)	0027100
0027500•	XMONIN=XMONIN+ARDEN*U(2,J)*U(2,J)	0027200
0027600•	WMONIN=WMONIN+ARDEN*U(2,J)*W(1,J)	0027300
0027700•	ANGMOM=ANGMOM+ARDEN*U(2,J)*W(1,J)*R(J)	0027400
0027800•	ARDENT=ARDENT+ARDEN	0027500
0027900•	200 FLOWIN=FLOWIN+ARDEN*U(2,J)	0027600
0028000•	UMEAN=FLOWIN/ARDENT	0027700
0028100•	SWRLNO=ANGMOM/(XMONIN*RSMALL)	0027800
0028200•	IF (W(1,JSTEP) .EQ. 0.) WMONIN=1.	0027900
0028300•	DO 202 I=2,NI	0028000
0028400•	IJ=JMAX(I-1)	0028100
0028500•	FACTOR=(YV(JSTEP)*RV(JSTEP))/(YV(IJ)*RV(IJ))	0028200
0028600•	JJ=JMAX(I-1)	0028300
0028700•	DO 202 J=2,JJ	0028400
0028800•	U(I,J)=UIN*FACTOR	0028500
0028900•	202 CONTINUE	0028600
0029000•	C	0028700
0029100•	IF (NSBR .EQ. 0) GO TO 219	0028800
0029200•	DO 209 I=2,NI	0028900
0029300•	JJ=JMAX(I)	0029000
0029400•	DO 209 J=2,JJ	0029100
0029500•	WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*U(I,2)	0029200
0029600•	W(I,J)=WINST*R(J)/R(JJ)	0029300
0029700•	TE(I,J)=TEIN	0029400
0029800•	ED(I,J)=EDIN	0029500
0029900•	209 CONTINUE	0029600
0030000•	GO TO 221	0029700
0030100•	C	0029800
0030200•	219 CONTINUE	0029900
0030300•	DO 220 I=2,NI	0030000
0030400•	JJ=JMAX(I)	0030100
0030500•	DO 220 J=2,JJ	0030200
0030600•	TE(I,J)=TEIN	0030300
0030700•	ED(I,J)=EDIN	0030400
0030800•	220 CONTINUE	0030500
0030900•	C	0030600
0031000•	221 CONTINUE	0030700
0031100•	DO 203 I=2,NIM1	0030800
0031200•	203 YPLUSN(I)=11.0	0030900
0031300•	DO 204 J=JSTEP,NJ	0031000
0031400•	XPLUSW(J)=11.0	0031100
0031500•	204 IF (J.EQ.JSTEP) XPLUSW(J)= 0.0	0031200
0031600•	URFVIS=.7	0031300

0064100•	SEWU(1)=0.0	0063800
0064200•	DO 107 I=2,NI	0063900
0064300•	107 SEWU(I)=X(I)-X(I-1)	0064000
0064400•	C-----U-VELOCITIES WEIGHTING FACTORS	0064100
0064500•	DO 111 I=2,NIM1	0064200
0064600•	WFE(I)=SEWU(I+1)/(SEWU(I+1)+SEWU(I))	0064300
0064700•	IF(I .LE. 2) GO TO 111	0064400
0064800•	WFW(I)=SEWU(I-1)/(SEWU(I-1)+SEWU(I))	0064500
0064900•	111 CONTINUE	0064600
0065000•	YV(1)=0.0	0064700
0065100•	RV(1)=0.0	0064800
0065200•	DO 108 J=2,NJ	0064900
0065300•	RV(J)=0.5*(R(J)+R(J-1))	0065000
0065400•	108 YV(J)=0.5*(Y(J)+Y(J-1))	0065100
0065500•	RCV(1)=R(1)	0065200
0065600•	RCV(NJ)=R(NJ)	0065300
0065700•	DO 113 J=2,NJM1	0065400
0065800•	113 RCV(J)=0.5*(RV(J+1)+RV(J))	0065500
0065900•	DYPSV(1)=0.0	0065600
0066000•	DYPSV(2)=0.0	0065700
0066100•	DYNPV(NJ)=0.0	0065800
0066200•	DO 109 J=2,NJM1	0065900
0066300•	DYNPV(J)=YV(J+1)-YV(J)	0066000
0066400•	109 DYPSV(J+1)=DYNPV(J)	0066100
0066500•	SNSV(1)=0.0	0066200
0066600•	DO 110 J=2,NJ	0066300
0066700•	110 SNSV(J)=Y(J)-Y(J-1)	0066400
0066800•	C-----V-VELOCITIES WEIGHTING FACTORS	0066500
0066900•	DO 112 J=3,NJM1	0066600
0067000•	WFN(J)=SNSV(J+1)/(SNSV(J+1)+SNSV(J))	0066700
0067100•	WFS(J)=SNSV(J-1)/(SNSV(J-1)+SNSV(J))	0066800
0067200•	112 CONTINUE	0066900
0067300•	C	0067000
0067400•	CHAPTER 2 2 2 2 2 2 SET VARIABLES TO ZERO 2 2 2 2 2 2	0067100
0067500•	C	0067200
0067600•	DO 200 I=1,NI	0067300
0067700•	TAUN(I)=1.0	0067400
0067800•	DO 200 J=1,NJ	0067500
0067900•	TAUW(J)=1.0	0067600
0068000•	UI(I,J)=0.0	0067700
0068100•	VI(I,J)=0.0	0067800
0068200•	WI(I,J)=0.	0067900
0068300•	PI(I,J)=0.0	0068000
0068400•	PP(I,J)=0.0	0068100
0068500•	TE(I,J)=0.0	0068200
0068600•	ED(I,J)=0.0	0068300
0068700•	DEN(I,J)=DENSIT	0068400
0068800•	VIS(I,J)=VISCOS	0068500
0068900•	DU(I,J)=0.0	0068600
0069000•	DV(I,J)=0.0	0068700
0069100•	SU(I,J)=0.0	0068800
0069200•	SP(I,J)=0.0	0068900
0069300•	STFN(I,J)=0.	0069000
0069400•	200 CONTINUE	0069100

0101900•	C	VISN=0.5*(VIS(I,J)+VIS(I,J+1))	0101600
0102000•		VISS=0.5*(VIS(I,J)+VIS(I,J-1))	0101700
0102100•		WISE=0.5*(VIS(I,J)+VIS(I+1,J))	0101800
0102200•		VISH=0.5*(VIS(I,J)+VIS(I-1,J))	0101900
0102300•		DN=VISN*AREAN/DYNP(J)	0102000
0102400•		DS=VISS*AREAS/DYPS(J)	0102100
0102500•		DE=WISE*AREAEW/DXEP(I)	0102200
0102600•		DW=VISH*AREAEW/DXPW(I)	0102300
0102700•			0102400
0102800•	C		0102500
0102900•	C-----SOURCE TERMS		0102600
0103000•	C		0102700
0103100•		SMP=CN-CS+CE-CW	0102800
0103200•		CP=AMAX1(0., SMP)	0102900
0103300•		CP0=CP	0103000
0103400•	C		0103100
0103500•	C-----ASSEMBLE MAIN COEFFICIENTS		0103200
0103600•	C		0103300
0103700•		AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN	0103400
0103800•		AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS	0103500
0103900•		AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE	0103600
0104000•		AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW	0103700
0104100•		DV=0.5*(AREAN+AREAS)	0103800
0104200•		VAVG=0.5*(V(I,J+1)+V(I,J))	0103900
0104300•		SU(I,J)=CP0*W(I,J)	0104000
0104400•		IF(INDCOS.EQ.1) GO TO 101	0104100
0104500•		SORCE1=-DEN(I,J)*VAVG*W(I,J)/RCV(J)	0104200
0104600•		SORCE2=-(VISN*RV(J+1)-VISS*RV(J))*W(I,J)/(DYNPV(J)*	0104300
0104700•		#RCV(J)*RCV(J))	0104400
0104800•		SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL	0104500
0104900•		SP(I,J)=-CP	0104600
0105000•	101 CONTINUE		0104700
0105100•	100 CONTINUE		0104800
0105200•	C		0104900
0105300•	CHAPTER 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 2 2 2		0105000
0105400•	C		0105100
0105500•		CALL PROMOD (8)	0105200
0105600•	C		0105300
0105700•	CHAPTER 3 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION		0105400
0105800•	C		0105500
0105900•		RESORW=0.	0105600
0106000•		DO 300 I=2, NIM1	0105700
0106100•		DO 301 J=2, NJM1	0105800
0106200•		AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)	0105900
0106300•		RESOR=AN(I,J)*W(I,J+1)+AS(I,J)*W(I,J-1)+AE(I,J)*W(I+1,J)	0106000
0106400•		* +AW(I,J)*W(I-1,J)-AP(I,J)*W(I,J)+SU(I,J)	0106100
0106500•		VOL=RCV(J)*SNS(J)*SEW(I)	0106200
0106600•		SORVOL=GREAT*VOL	0106300
0106700•		IF(1-SP(I,J).GT.0.5*SORVOL) RESOR=RESOR/SORVOL	0106400
0106800•		IF(J.LE.2) RESOR=0.	0106500
0106900•		RESORW=RESORW+ABS(RESOR)	0106600
0107000•	C		0106700
0107100•	C-----UNDER RELAXATION		0106800
0107200•	C		0106900

0139700•	SU(I,J)=SU(I,J)+(1.-URFE)*AP(I,J)*ED(I,J)	0139400
0139800•	301 CONTINUE	0139500
0139900•	300 CONTINUE	0139600
0140000•	C	0139700
0140100•	CHAPTER 4 4 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4	0139800
0140200•	C	0139900
0140300•	DO 400 N=1,NSWPD	0140000
0140400•	400 CALL LISOLV(2,2,NI,JMAX,IT,JT,ED,7)	0140100
0140500•	RETURN	0140200
0140600•	END	0140300
0140700•	C	0140400
0140800•	C-----	0140500
0140900•	C	0140600
0141000•	SUBROUTINE LISOLV(ISTART,JSTART,NI,JMAX,IT,JT,PHI,NCHAP)	0140700
0141100•	CA*****	0140800
0141200•	C	0140900
0141300•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0141000
0141400•	C	0141100
0141500•	DIMENSION PHI(IT,JT),A(48),B(48),C(48),D(48),JMAX(IT)	0141200
0141600•	COMMON	0141300
0141700•	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0141400
0141800•	1 SP(48,24)	0141500
0141900•	1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,	0141600
0142000•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0141700
0142100•	JSM1=JSTART-1	0141800
0142200•	NIM1=NI-1	0141900
0142300•	A(JSM1)=0.0	0142000
0142400•	C-----COMMENCE W-E SWEEP	0142100
0142500•	DO 100 I=ISTART,NIM1	0142200
0142600•	C(JSM1)=PHI(I,JSM1)	0142300
0142700•	C-----COMMENCE S-N TRAVERSE	0142400
0142800•	JI=JMAX(I)	0142500
0142900•	IF(NCHAP.EQ.2) JI=JMAX(I-1)	0142600
0143000•	DO 101 J=JSTART,JI	0142700
0143100•	C-----ASSEMBLE TDMA COEFFICIENTS	0142800
0143200•	A(J)=AN(I,J)	0142900
0143300•	B(J)=AS(I,J)	0143000
0143400•	C(J)=AE(I,J)*PHI(I+1,J)+AW(I,J)*PHI(I-1,J)+SU(I,J)	0143100
0143500•	D(J)=AP(I,J)	0143200
0143600•	C-----CALCULATE COEFFICIENTS OF RECURRENCE FORMULA	0143300
0143700•	TERM=1./(D(J)-B(J)*A(J-1))	0143400
0143800•	A(J)=A(J)*TERM	0143500
0143900•	C(J)=(C(J)+B(J)*C(J-1))*TERM	0143600
0144000•	101 CONTINUE	0143700
0144100•	C-----OBTAIN NEW PHIS	0143800
0144200•	DO 102 JJ=JSTART,JI	0143900
0144300•	J=JI+1+JSM1-JJ	0144000
0144400•	102 PHI(I,J)=A(J)*PHI(I,J+1)+C(J)	0144100
0144500•	100 CONTINUE	0144200
0144600•	RETURN	0144300
0144700•	END	0144400
0144800•	C	0144500
0144900•	C-----	0144600
0145000•	C	0144700

0177500•	C-----TOP WALL	0177200
0177600•	CDTERM=CMU*0.25	0177300
0177700•	DO 810 I=2,NIM1	0177400
0177800•	J=JMAX(I)	0177500
0177900•	YP=YV(J+1)-Y(J)	0177600
0178000•	SQRTK=SQRT(TE(I,J))	0177700
0178100•	DENW=DEN(I,J)	0177800
0178200•	YPLUSA=YPLUSN(I)	0177900
0178300•	IF(YPLUSA .LE. 11.63) GO TO 811	0178000
0178400•	TMULT=DENW*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSA)-VIS(I,J)/R(J)	0178100
0178500•	GO TO 812	0178200
0178600•	811 TMULT=VISCOS/YP	0178300
0178700•	812 SP(I,J)=SP(I,J)-TMULT*SEW(I)*RV(J+1)	0178400
0178800•	AN(I,J)=0.0	0178500
0178900•	810 CONTINUE	0178600
0179000•	C-----SIDE WALL	0178700
0179100•	IF(JSTEP .EQ. NJM1) GO TO 814	0178800
0179200•	DO 855 I=2,NIM1	0178900
0179300•	IF(JMAX(I-1) .GE. JMAX(I)) GO TO 855	0179000
0179400•	JJ=JMAXP1(I-1)	0179100
0179500•	JI=JMAX(I)	0179200
0179600•	DO 850 J=JJ,JI	0179300
0179700•	XP=X(I)-XU(I)	0179400
0179800•	SQRTK=SQRT(TE(I,J))	0179500
0179900•	DENW=DEN(I,J)	0179600
0180000•	XPLUSA=XPLUSW(J)	0179700
0180100•	IF(XPLUSA .LE. 11.63) GO TO 851	0179800
0180200•	TMULT=DENW*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSA)	0179900
0180300•	GO TO 852	0180000
0180400•	851 TMULT=VISCOS/XP	0180100
0180500•	852 SP(I,J)=SP(I,J)-TMULT*SNS(J)*RCV(J)	0180200
0180600•	AW(I,J)=0.	0180300
0180700•	850 CONTINUE	0180400
0180800•	855 CONTINUE	0180500
0180900•	C-----SYMMETRY AXIS	0180600
0181000•	814 CONTINUE	0180700
0181100•	C-----FIX W FOR SOLID BODY ROTATION AT J=2 USING W AT J=3	0180800
0181200•	DO 860 I=2,NIM1	0180900
0181300•	TERM=W(I,3)*R(2)/R(3)	0181000
0181400•	SU(I,2)=GREAT*TERM	0181100
0181500•	860 SP(I,2)=-GREAT	0181200
0181600•	C-----OUTLET	0181300
0181700•	DO 870 J=2,NJM1	0181400
0181800•	870 AE(NIM1,J)=0.	0181500
0181900•	RETURN	0181600
0182000•	END	0181700
0182100•	C	0181800
0182200•	C-----	0181900
0182300•	C	0182000
0182400•	SUBROUTINE STRMFN	0182100
0182500•	CA*****	0182200
0182600•	C	0182300
0182700•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0182400
0182800•	C	0182500

0031700•	CALL PROPS	0031400
0031800•	C-----INITIAL OUTPUT	0031500
0031900•	WRITE(6,211)	0031600
0032000•	IK=JMAXP1(ISTEP)	0031700
0032100•	YSLOPE=YV(IK)-YV(JSTP1)	0031800
0032200•	IF(JMAX(ISTEP) .LT. NJM1) ALPHA=ATAN(YSLOPE/SEWU(2))*180./3.14159	0031900
0032300•	IF(IJSTEP .LT. NJM1) .AND. (JMAX(ISTEP) .EQ. NJM1) ALPHA=90.	0032000
0032400•	WRITE(6,225) ALPHA	0032100
0032500•	WRITE(6,235) RSMALL	0032200
0032600•	WRITE(6,240) RLARGE	0032300
0032700•	WRITE(6,245) ALTOT	0032400
0032800•	RE=UIN*RSMALL*2.0*DENSIT/VISCOS	0032500
0032900•	WRITE(6,250) RE	0032600
0033000•	WRITE(6,255) VISCOS	0032700
0033100•	RSDRL=RSMALL/RLARGE	0032800
0033200•	WRITE(6,260) DENSIT	0032900
0033300•	295 CONTINUE	0033000
0033400•	IF(.NOT. IWRITE) GO TO 297	0033100
0033500•	WRITE(11) X	0033200
0033600•	WRITE(11) Y	0033300
0033700•	WRITE(14) XUND	0033400
0033800•	297 CONTINUE	0033500
0033900•	IF(.NOT. IREAD) GO TO 298	0033600
0034000•	READ(12) U	0033700
0034100•	READ(12) V	0033800
0034200•	READ(12) W	0033900
0034300•	READ(12) P	0034000
0034400•	READ(12) TE	0034100
0034500•	READ(12) ED	0034200
0034600•	READ(12) VIS	0034300
0034700•	READ(12) STFEN	0034400
0034800•	298 CONTINUE	0034500
0034900•	IF(.NOT. INITAL) GO TO 299	0034600
0035000•	IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)	0034700
0035100•	IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)	0034800
0035200•	IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,W,HEDW)	0034900
0035300•	IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,TE,HEDK)	0035000
0035400•	IF(INCALD) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)	0035100
0035500•	299 CONTINUE	0035200
0035600•	RESORU=.005	0035300
0035700•	URFP=1.	0035400
0035800•	RESORV=.005	0035500
0035900•	RESORW=.005	0035600
0036000•	C	0035700
0036100•	CHAPTER 3 3 3 3 3 3 3 ITERATION LOOP 3 3 3 3 3 3 3 3	0035800
0036200•	C	0035900
0036300•	WRITE(6,310) IMON,JMON	0036000
0036400•	300 NITER=NITER+1	0036100
0036500•	DO 330 I=2,NIM1	0036200
0036600•	DO 330 J=2,NJM1	0036300
0036700•	330 PP(I,J)=0.	0036400
0036800•	IF(LFS .GE. 3) GO TO 425	0036500
0036900•	URFU=.5	0036600
0037000•	URFV=.5	0036700

0069500•	DO 300 I=1,NI	0069200
0069600•	DO 300 J=1,NSTLN	0069300
0069700•	YSTLN(I,J)=0.	0069400
0069800•	YSTLND(I,J)=0.	0069500
0069900•	STVAL(J)=0.	0069600
0070000•	300 CONTINUE	0069700
0070100•	DO 400 N=1,NPLTLN	0069800
0070200•	DO 400 I=1,NI	0069900
0070300•	YSLPLT(N,I)=0.	0070000
0070400•	400 CONTINUE	0070100
0070500•	RETURN	0070200
0070600•	END	0070300
0070700•	C	0070400
0070800•	C-----	0070500
0070900•	C	0070600
0071000•	SUBROUTINE PROPS	0070700
0071100•	CA*****	0070800
0071200•	C	0070900
0071300•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0071000
0071400•	C	0071100
0071500•	COMMON	0071200
0071600•	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0071300
0071700•	*/VAR/UI(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0071400
0071800•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0071500
0071900•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0071600
0072000•	#,VISTAR(48,24)	0071700
0072100•	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0071800
0072200•	1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE	0071900
0072300•	C	0072000
0072400•	CHAPTER 1 1 1 VISCOSITY 1 1 1	0072100
0072500•	C	0072200
0072600•	DO 100 I=2,NIM1	0072300
0072700•	DO 100 J=2,NJM1	0072400
0072800•	VISOLD=VIS(I,J)	0072500
0072900•	IF(ED(I,J).EQ.0.) GO TO 102	0072600
0073000•	VIS(I,J)=DEN(I,J)*TE(I,J)**2*CMU/ED(I,J)+VISCOS	0072700
0073100•	GO TO 101	0072800
0073200•	102 VIS(I,J)=VISCOS	0072900
0073300•	C-----UNDER-RELAX VISCOSITY	0073000
0073400•	101 VIS(I,J)=URFVIS*VIS(I,J)+(1.-URFVIS)*VISOLD	0073100
0073500•	100 CONTINUE	0073200
0073600•	RETURN	0073300
0073700•	END	0073400
0073800•	C	0073500
0073900•	C-----	0073600
0074000•	C	0073700
0074100•	SUBROUTINE CALCU	0073800
0074200•	CA*****	0073900
0074300•	C	0074000
0074400•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0074100
0074500•	C	0074200
0074600•	COMMON	0074300
0074700•	1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)	0074400
0074800•	1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)	0074500

0107300•	AP(I,J)=AP(I,J)/URFW	0107000
0107400•	SU(I,J)=SU(I,J)+(1.-URFW)*AP(I,J)*W(I,J)	0107100
0107500•	301 CONTINUE	0107200
0107600•	300 CONTINUE	0107300
0107700•	C	0107400
0107800•	CHAPTER 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4 4 4	0107500
0107900•	C	0107600
0108000•	DO 400 N=1, NSWPW	0107700
0108100•	400 CALL LISOLV(2, 2, NI, JMAX, IT, JT, W,8)	0107800
0108200•	500 CONTINUE	0107900
0108300•	RETURN	0108000
0108400•	END	0108100
0108500•	C	0108200
0108600•	C-----	0108300
0108700•	C	0108400
0108800•	SUBROUTINE CALCP	0108500
0108900•	CA*****	0108600
0109000•	C	0108700
0109100•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0108800
0109200•	C	0108900
0109300•	COMMON	0109000
0109400•	1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF	0109100
0109500•	*VAR/U(48,24),V(48,24),W(48,24),P(48,24),PP(48,24),TE(48,24),	0109200
0109600•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0109300
0109700•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0109400
0109800•	#,VISTAR(48,24)	0109500
0109900•	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0109600
0110000•	1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0109700
0110100•	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0109800
0110200•	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0109900
0110300•	#YND(24),YVND(24)	0110000
0110400•	COMMON	0110100
0110500•	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0110200
0110600•	1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),	0110300
0110700•	1 SP(48,24)	0110400
0110800•	1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,	0110500
0110900•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0110600
0111000•	RESORM=0.0	0110700
0111100•	C	0110800
0111200•	CHAPTER 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1	0110900
0111300•	C	0111000
0111400•	DO 100 I=2,NIM1	0111100
0111500•	DO 101 J=2,NJM1	0111200
0111600•	C-----COMPUTE AREAS AND VOLUME	0111300
0111700•	AREAN=RV(J+1)*SEW(I)	0111400
0111800•	AREAS=RV(J)*SEW(I)	0111500
0111900•	AREAEW=RCV(J)*SNS(J)	0111600
0112000•	VOL=RCV(J)*SNS(J)*SEW(I)	0111700
0112100•	C-----CALCULATE COEFFICIENTS	0111800
0112200•	DENN=0.5*(DEN(I,J)+DEN(I,J+1))	0111900
0112300•	DENS=0.5*(DEN(I,J)+DEN(I,J-1))	0112000
0112400•	DENE=0.5*(DEN(I,J)+DEN(I+1,J))	0112100
0112500•	DENW=0.5*(DEN(I,J)+DEN(I-1,J))	0112200
0112600•	AN(I,J)=DENN*AREAN*DV(I,J+1)	0112300

0145100•	SUBROUTINE PRINT(ISTART,JSTART,NI,NJ,IT,JT,X,Y,PHI,HEAD)	0144800
0145200•	CA*****	0144900
0145300•	C	0145000
0145400•	DIMENSION PHI(IT,JT),X(IT),Y(JT),HEAD(9),STORE(48)	0145100
0145500•	ISKIP=1	0145200
0145600•	JSKIP=1	0145300
0145700•	WRITE(6,110)HEAD	0145400
0145800•	ISTA=ISTART-12	0145500
0145900•	100 CONTINUE	0145600
0146000•	ISTA=ISTA+12	0145700
0146100•	IEND=ISTA+11	0145800
0146200•	IF(NI.LT.IEND)IEND=NI	0145900
0146300•	WRITE(6,111)(I,I=ISTA,IEND,ISKIP)	0146000
0146400•	WRITE(6,114)(X(I),I=ISTA,IEND,ISKIP)	0146100
0146500•	WRITE(6,112)	0146200
0146600•	DO 101 JJ=JSTART,NJ,JSKIP	0146300
0146700•	J=JSTART+NJ-JJ	0146400
0146800•	DO 120 I=ISTA,IEND	0146500
0146900•	A=PHI(I,J)	0146600
0147000•	IF(ABS(A).LT.1.E-20) A=0.0	0146700
0147100•	120 STORE(I)=A	0146800
0147200•	101 WRITE(6,113)J,Y(J),(STORE(I),I=ISTA,IEND,ISKIP)	0146900
0147300•	IF(IEND.LT.NI)GO TO 100	0147000
0147400•	RETURN	0147100
0147500•	110 FORMAT(1H0,17(2H*-),7X,9A4,7X,17(2H-*))	0147200
0147600•	111 FORMAT(1H0,13H I = ,12,11I9)	0147300
0147700•	112 FORMAT(8H0 J Y)	0147400
0147800•	113 FORMAT(13,OPF8.5,1X,1P12E9.2)	0147500
0147900•	114 FORMAT(11H x = ,F8.5,11F9.5)	0147600
0148000•	END	0147700
0148100•	C	0147800
0148200•	C-----	0147900
0148300•	C	0148000
0148400•	SUBROUTINE PROMOD (INCHAP)	0148100
0148500•	CA*****	0148200
0148600•	C	0148300
0148700•	CHAPTER 0 0 0 0 0 0 0 0 PRELIMINARIES 0 0 0 0 0 0 0 0	0148400
0148800•	C	0148500
0148900•	COMMON	0148600
0149000•	1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)	0148700
0149100•	1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)	0148800
0149200•	*/WVEL/ RESORW, NSWPW, URFW	0148900
0149300•	*/VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),	0149000
0149400•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0149100
0149500•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0149200
0149600•	*,VISTAR(48,24)	0149300
0149700•	1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF	0149400
0149800•	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0149500
0149900•	1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0149600
0150000•	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0149700
0150100•	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0149800
0150200•	#YND(24),YVND(24)	0149900
0150300•	COMMON	0150000
0150400•	1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)	0150100

0182900•	COMMON	0182600
0183000•	1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)	0182700
0183100•	*VAR/U(48,24),V(48,24),W(48,24),P(48,24),PP(48,24),TE(48,24),	0182800
0183200•	*ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),	0182900
0183300•	*VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)	0183000
0183400•	#,VISTAR(48,24)	0183100
0183500•	1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)	0183200
0183600•	1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),	0183300
0183700•	1 SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),	0183400
0183800•	# WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),	0183500
0183900•	#YND(24),YVND(24)	0183600
0184000•	1/KASE T1/UID,TEIN,EDIN,FLOWIN,ALAMDA,	0183700
0184100•	2 RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1	0183800
0184200•	1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT	0183900
0184300•	LOGICAL INPLOT	0184000
0184400•	C	0184100
0184500•	CHAPTER 1 1 1 1 1 CALCULATE STREAM FCN BASED ON VOLUMETRIC FLOW	0184200
0184600•	C	0184300
0184700•	C	0184400
0184800•	Q=UIN*(RSMALL**2)/2.	0184500
0184900•	DO 400 I=2,NI	0184600
0185000•	IF(JMAX(I-1).LT.5)GO TO 400	0184700
0185100•	STFN(I,2)=(Y(2)*R(2)*U(I,2)*.5)/Q	0184800
0185200•	JJ=JMAX(I-1)	0184900
0185300•	DO 200 J=3,JJ	0185000
0185400•	STFN(I,J)=STFN(I,J-1)+SNSV(J)*(R(J-1)*U(I,J-1)+R(J)*U(I,J))*5/Q	0185100
0185500•	200 CONTINUE	0185200
0185600•	400 CONTINUE	0185300
0185700•	C	0185400
0185800•	DO 800 I=2,NI	0185500
0185900•	IJ=JMAXP1(I-1)	0185600
0186000•	DO 700 K=1,NSTLN	0185700
0186100•	AK=K-1	0185800
0186200•	STVAL(K)=AK*.1	0185900
0186300•	JJ=JMAX(I-1)	0186000
0186400•	DO 600 J=2,JJ	0186100
0186500•	IF(STFN(I,J).GE.STVAL(K))GO TO 650	0186200
0186600•	600 CONTINUE	0186300
0186700•	YSTLN(I,K)=RV(IJ)	0186400
0186800•	GO TO 670	0186500
0186900•	650 IF(J.EQ.2)YSTLN(I,K)=0.0	0186600
0187000•	IF(J.EQ.2)GO TO 670	0186700
0187100•	SLOPE=(STVAL(K)-STFN(I,J-1))/(STFN(I,J)-STFN(I,J-1))	0186800
0187200•	YSTLN(I,K)=Y(J-1)+SLOPE*(Y(J)-Y(J-1))	0186900
0187300•	670 CONTINUE	0187000
0187400•	YSTLND(I,K)=YSTLN(I,K)/(2.*RLARGE)	0187100
0187500•	700 CONTINUE	0187200
0187600•	800 CONTINUE	0187300
0187700•	IF(.NOT.INPLOT)GO TO 745	0187400
0187800•	N=0	0187500
0187900•	DO 730 K=1,11,2	0187600
0188000•	N=N+1	0187700
0188100•	DO 730 I=1,NIM1	0187800
0188200•	YSLPLT(N,I)=YSTLND(I+1,K)	0187900

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16. Abstract A primitive pressure-velocity variable finite difference computer code has been developed to predict swirling recirculating inert turbulent flows in axisymmetric combustors in general, and for application to a specific idealized combustion chamber with sudden or gradual expansion. The technique involves a staggered grid system for axial and radial velocities, a line relaxation procedure for efficient solution of the equations, a two-equation k-ϵ turbulence model, a stairstep boundary representation of the expansion flow, and realistic accommodation of swirl effects. This report is a user's manual and deals with the computational problem, showing how the mathematical basis and computational scheme may be translated into a computer program. A flow chart, Fortran 4 listing, notes about various subroutines and a user's guide are supplied as an aid to prospective users of the code.					
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